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AN ANALYSIS OF A PHASE OF THE PROCESS OF CLASSIFYING¹

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I. INTRODUCTION

In the course of a recent study of the process of generalizing abstraction,² we discovered that our conditions offered exceptional opportunity for an additional investigation of the

¹ From the Psychological Laboratory of Clark University.

² The Process of Generalizing Abstraction; and its Product, the General Concept. *Psychol. Mon.*, 1916, No. 90.

process of classifying. Accordingly, we introduced experiments which were directed to the analysis of this process in one of its phases; and the object of the present paper is to set forth the results of these experiments.³

II. DESCRIPTION OF THE EXPERIMENT

A. PROBLEM. Our specific problem was to investigate the mental contents which are involved in the process of classifying, or refusing to classify, novel percepts with a group already familiar. Our approach to the problem has been a genetic one; our aim was to arrange conditions so that the extent of the observer's experience with the group, and hence the possibility of rapid and accurate classification of novel percepts, should increase as the experiments progressed.

B. METHOD. 1. *Materials and Apparatus.* The material of our experiments consisted in a series of drawings which were analogous to other drawings employed in the experiments on generalizing, and constituting the raw-material of the general concepts formed by the observers in those experiments.

In the experiments on generalizing, we employed four groups of ten drawings each, the drawings of every group containing certain characteristics which were common to the group, and others which were not common. These drawings were of unusual shapes, and they represented no particular objects. With each was exposed a meaningless word which represented the class name of the group, the four words being 'Zalof,' 'Deral,' 'Tefoq,' and 'Kareg.' A group of ten drawings (*e. g.*, the Zalof group) was exposed successively to the observer, who was told that he would subsequently be asked to define the group name (*e. g.*, give a definition of 'Zalof'). The successful performance of this task necessitated the observers' looking for the features which were essential to the group. The presentation of the series was repeated at weekly or semi-weekly intervals until the observers ceased to note novel characteristics in the features, when the presentation of another series was commenced. A complete account of the material and method will be found on pp. 34 ff. of our monograph.

The drawings which we employed in our present experiments were capable of arousing novel percepts of a sort comparable with the other homogenous percept groups already experienced by the observer. Of these drawings, some con-

³ The importance of the investigation of the classification-consciousness has been pointed out by Royce (*Recent Logical Inquiries and their Psychological Bearings, Psychol. Rev.*, 1902, 9, 105-133.) We have found little or no experimental literature bearing directly on the subject of the conscious nature of classifying; this subject has been treated in the literature in close conjunction with the subjects of generalization and the concept. A résumé of the literature on generalization will be found in our monograph on generalizing abstraction (*op. cit.*)

tained the features which were essential to some one of the four generalization-groups, and consequently were homogeneous with this group. Others of these drawings lacked one or more of the essential features, while still others were totally novel. Table I presents (in the first column) the number, (in the second column) the correct classification, and (in the third column) a description of each drawing.

The drawings were made on sheets of four-ply white cardboard similar to those employed for the generalization-drawings. The size, as before, was 20.5 by 12.5 cm. The drawings of the classification-series were exposed singly to the observer (for classification) on a simple tachistoscope, the exposure being made by means of raising or lowering a thin wooden shutter.

2. *Observers.* The observers were five in number. All were trained and skilful introspectors. All excepting one were members of the department of experimental psychology of the University. They were Dr. J. W. Baird, Dr. S. W. Fernberger, Dr. E. O. Finkenbinder, Dr. Miriam van Waters, and Dr. Elizabeth L. Woods.

3. *Procedure.* The experiments were conducted in close conjunction with those on generalizing. After the observer had seen and defined a generalization-group (*e. g.*, Zalof), he was shown a member of the corresponding classification-series, his task being to state whether or not the drawing was to be classified with that series (*e. g.*, "Is this a Zalof?"). He was subsequently asked to furnish an introspective account of his experience in classifying or refusing to classify the stimulus with the group. The time required for making the classification-judgment was taken by counting the ticks of a stop-watch between the time of the raising of the shutter and the response of the observer. This procedure was repeated as often as the time available for the sitting allowed, the number of successive classifications varying between one and six. The total number of classifications and introspections obtained was two hundred and thirty-two.

TABLE I

The cards of the classification-series, with the correct classification and a description of each card. The first column at the left contains the numbers of the cards, the second column contains their correct classifications, and the third column contains brief descriptions of the figures.

<i>Card</i>	<i>Correct number</i>	<i>classification</i>	<i>Description</i>
<i>Zalof series:</i>			
1	Not a Zalof (?)	Blue central parts; large central body and short protuberances; convex sides; roughly triangular	

TABLE I—Continued

Card number	Correct classification	Description
2	Zalof.....	Fairly large; very black protuberances
3	Not a Zalof.....	Roughly hexagonal in shape; moderate size; no protuberances; center red, roughly five-lobed, minus central circular part
4	Not a Zalof.....	Four protuberances; body squarish; body and protuberances black, center dark gray and roundish, minus the three projecting bodies
5	Not a Zalof.....	Each pair of terminal arborizations lacks two external fibrils; otherwise figure is Zalof. Red central parts; heavily striated protuberances
6	Not a Zalof.....	No protuberances; roughly tre-foil in shape; center blue
7	Zalof.....	Rather small, fine, and light
8	Not a Zalof.....	Protuberances not bifurcated, and almost absent, each corner of the figure having four finger-like projections
9	Not a Zalof.....	Protuberances arborize wrongly, dividing into two groups of finger-like projections. Center lacks tri-partite form
10	Zalof.....	Protuberances very long, relative to size of central body
11	Not a Zalof.....	Protuberances divide into three (instead of two) groups of tentacles
12	Not a Zalof.....	Protuberances roughly knobbed at termini, and not arborized; they are relatively very short
13	Not a Zalof.....	Central parts missing
14	Zalof.....	Protuberances shortish and roughly striated; triangular form scalene; roughly-formed center
15	Not a Zalof.....	Protuberances not arborized, but roughly knobbed
16	Not a Zalof.....	Protuberances absent
17	Zalof.....	Smallish; central parts uncolored
18	Not a Zalof.....	Terminal arborizations absent

Deral Series:

1	Not a Deral . . .	Left side gray (instead of colored)
2	Deral.	Vivid red left part
3	Not a Deral . . .	Lower left straight contour-line missing. Concavity in left contour missing. Leftward point in median line absent
4	Not a Deral . . .	Right side colored (instead of uncolored)
4a	Not a Deral . . .	Orientation altered, figure turned through 90 degrees; concavity of right side lacking
5	Deral.	Right side filled in with large ovalish outline-figures
6	Not a Deral . . .	Both sides colored. Point in median line faces rightward (instead of leftward). Peripheral contour of each half ovalish, save for basal regions
7	Deral.	Very small
8	Not a Deral . . .	Both sides colored
9	Not a Deral . . .	Point in median line faces rightward. Contour lacks right and left concavities
10	Not a Deral . . .	Detached rays surround colored (left) side
11	Not a Deral . . .	Contour on right incorrect

TABLE I—Continued

Card number	Correct classification	Description
12	Not a Deral....	Point in median line absent
13	Not a Deral....	Upper lobe of left side absent
14	Not a Deral....	Contour of right side lacks concavity and basal projection
15	Not a Deral....	Contour of left side lacks straight line and concavity
16	Not a Deral....	Extreme lower right peripheral contour of left side not straight, but irregularly convex
17	Not a Deral....	Median line lacks point, but has instead a curve
18	Not a Deral....	Left side filled in with splotches of various colors, instead of having uniform color
19	Deral.....	Right side black
<i>Tefoq Series:</i>		
1	Not a Tefoq (?).	Circular background has irregular patches of color instead of uniform color
2	Not a Tefoq. . .	Angular central part too many-sided; central irregular design incorrect
3	Tefoq.	Periphery very irregular
4	Not a Tefoq. . .	Indentation in lower periphery missing
5	Not a Tefoq. . .	Periphery perfectly circular; central irregular design absent
6	Tefoq.	Smallish; background plain
7	Not a Tefoq. . .	Central part curvilinear, instead of rectilinear and angular. Indentation in lower periphery minus one prong
8	Tefoq (?). . .	Periphery perfectly circular
9	Not a Tefoq. . .	Central (angular) part uncolored
10	Tefoq.	Angular central part enormously elongated
11	Tefoq (?). . .	Periphery has saw-tooth-like projections
12	Not a Tefoq. . .	Small triangle absent
13	Not a Tefoq. . .	Angular central body turned through 180 degrees
14	Tefoq.	Small triangle uncolored
<i>Kareg Series:</i>		
1	Kareg.	Very large; irregular; shaded by lines, slightly tri-dimensional in effect
2	Not a Kareg. . .	Color red; otherwise correct
3	Kareg.	Smallish; shaded by lines
4	Not a Kareg (?).	Left part divided by vertical axis, and shaded so as to give roughly the effect of two low cones, held base to base and viewed from the side
5	Not a Kareg. . .	Right side and neck missing
6	Kareg.	Shaded in grays
7	Not a Kareg (?).	Sides outlined by arcs of perfect circles, and shaded with concentric arcs.
8	Not a Kareg (?).	Left side perfect square, shaded to give effect of pyramid with point toward eye

III. RESULTS

A. INTROSPECTIVE DATA. In the case of every observer, the examining of the classification figures embraced a peculiar succession of processes which was obviously dependent on

the experimenter's question: "Is this a Zalof (or Deral, etc.)?" This peculiar succession was characterized by the fact that the attention and regard moved in a more or less rapid course over the regions of the figure which corresponded to those regions of the generalization-group that had been found to contain essential features. Moreover, the behavior of these regions themselves in consciousness varied in a manner which was correlative with their objective resemblance or lack of resemblance to their counterparts in the original group. While the observers thus showed a remarkable uniformity in the general course of their consciousness, they nevertheless differed in many respects, both structurally and functionally. Structurally, the variations consisted in the nature of the imagery which supplemented the observers' classifying of the figures.⁴ Functionally, the variations were concerned with the extent to which supplementary imagery appeared, with the conditions under which it occurred, with the extent to which the course of attention was deflected to the regions of striking variables, and with the relative strength or dominating power of the main coursing of consciousness over the figure (which constituted the process of classification) on the one hand, and of the behavior in consciousness of separate features, on the other. We shall begin by presenting a number of typical introspections of each observer's classifications of the figures; and we shall then present a general description of the processes which constituted the classifications, endeavoring to indicate both the similarities and the differences among our observers. With each introspection we shall include a mention of the time which elapsed between the presentation of the card, and the verbalizing of the judgment.

OBSERVER A

Zalof, Card 3 (November 18, 1912) "No." Time, .5 sec. Introspection: "I simply noted the shape of the figure,—which was round and large. I had no attitude of looking further, but immediately responded 'no.'"

Zalof, Card 5 (December 3, 1912) "Yes." Time, 1.5 sec. Introspection: "My glance went first to the branch on the right; I saw the ends of the branch, and then the center, and started to say 'yes.' My 'yes' almost stopped, when I noted the presence of four branches; at this moment I had a visual image of the original three branches in the figure."

Zalof, Card 7 (December 3, 1912) "Yes." Time, .9 sec. Introspection: "The features of the figure came into my attention very

⁴ We shall use the term 'classifying' (unless otherwise qualified) in referring to the total observation of the classification-figure, together with the affirmative or negative judgment in which it culminated.

quickly, one after the other. Immediately I said 'yes.' After that I was aware of a tendency to verify my judgment; this consisted in the appearing of a visual image of a figure of the original series which resembled the figure which had just been exposed, and in my viewing the two images side by side."

Zalof, Card 10 (December 3, 1912) "Yes." Time, 1.75 sec. Introspection: "First of all I was vaguely aware of the whole figure; then I ran my eyes out to the ends of the various branches. The sub-branches terminated in points, and that seemed to 'stir up' my answer 'yes.' As soon as I had given this affirmative response, I was aware of a desire to look at the central parts of the figure,—to see if that center were present. This consisted mainly in a turning of my attention toward that region, together with visual imagery of what the center might have been. I was also aware of a visual image of the first member of the Zalof series, in which the center was clearer than the rest of the figure."

Zalof, Card 11 (January 14, 1913) "Yes." Time, 1.2 sec. Introspection: "I was aware, at the outset, of looking fixedly at the center; my attention was held by the various lines about the center, and this amounted almost to a confusion or a distraction. As soon as I could, I removed my attention from the central region and my glance went to the ends of the branches. I was aware of two groups of branches at the end of each main branch,—I glanced in turn at the ends of each of the three branches.—and then I said 'yes.' The general shape and the presence of the two groups of branches at the end of each main branch meant 'yes,'—meant Zalof. My actual perception of these features gave me my affirmative response."

Zalof, Card 5 (January 28, 1913) "No." Time, 4.2 sec. Introspection: "My eye fell first upon the right-hand part of the figure and I was vaguely conscious of its blackness, although I did not attend to this. Instead my attention immediately went to the essentials of the figure; and I noted that the branch which I was fixating had two groups of tentacles at its end, and that each of these two groups was divided into still smaller ones. I found, however, that these smallest branches were only two in number. I glanced toward the left, and saw that the end of the next branch was the same. I then glanced at the lower branch and found that this also was the same. The presence of these variations in the ends of the branches compelled me to say 'no.' this compulsion consisted in the fact that I tended to turn away from them as from a difference. Then the presence of the black lines extending through the tentacles stood out; this constituted another prominent difference and seemed to add to my tendency to turn away from the figure. The whole situation meant 'no.' I did not take time to observe any other features, but immediately gave my negative response."

Deral, Card 3 (December 10, 1912) "No." Time, 2.8 sec. Introspection: "I was aware of the shape of the present figure; it had two parts, one at the left and one at the right. I called up images of the original figures, which I compared with the percept; I looked at several of them to see if they had this particular shape and size. At that time I was wavering between tendencies to say 'yes' and 'no'; I might have said either. I was aware of hesitation; I was then aware that this percept could be called a Deral, if it were cut in a certain way; I had imagery of the experimenter in the act of cutting it in this fashion. At the same time, I was aware that the images of the original figures did not in any case possess the same

shape as my percept; this fact was the clearest in my consciousness. My answer 'no' followed."

Deral, Card 2 (January 21, 1913) "Yes." Time, 3.4 sec. Introspection: "I had to investigate every part of the figure, because it was so extremely red. My attention went to the redness; I then began investigating the other parts,—the little angle at the right-hand side, the projecting dotted area, and the rest. The little angle of the base of the left-hand side stood out clearly from the straight line at the base of the central projecting part of the figure (right-hand side). The dotted area was remarkably large. In the case of every feature I was aware first of a feeling of familiarity with that feature, and next of a verification of it by comparing it with images of the original series. My affirmative response followed."

Deral, Card 4 (January 28, 1913) "Ye-e-e-s. The color upon the other side is just a deception; the form is the main thing." Time, 1.8 sec. Introspection: "My attention went first to the form. When I perceived its doubleness I was aware of clear visual images of some of the other figures, which I compared with the present one. I knew that they were not the same in all respects, but that they were the same in the essentials. The 'yes' started to say itself and then I perceived the color. My awareness of the color tended to check my 'yes' but it did not constitute enough of a check to make me say 'no.'"

Deral, Card 5 (February 4, 1913) "Yes." Time, 2.2 sec. Introspection: "I attended to this figure in the same way as I had attended to the figures of the original series, in their previous exposure. My attention went first to the two straight lines; these stood out easily and quickly, and no differences occurred as my attention passed across them. The way I perceived the lines,—the ease and quickness with which my regard went over them,—the fact that they demanded no attention—meant 'same.' I glanced at the rest of the figure, seeing the lobes and the central projecting part; my response came automatically; and at the same time, or immediately before, I saw the lines in the figure. These persisted most prominently after the response."

Tefoq, Card 1 (February 18, 1913) "Yes." Time, 1.8 sec. Introspection: "The figure was vague at first; presently my attention went in a half-hearted fashion to the central region, although I did not see this in detail. It then went to the indentation in the lower periphery. I then saw the colored patches; my awareness of this was followed by vocal-motor imagery of saying 'no.' I then turned to these essential things, and made an effort to recall the figures of the original series. I saw that certain features were common; but I was unable to recall another case in which the colored patches on the background were present. These were not essential, however, and I answered 'yes.'"

Tefoq, Card 4 (March 11, 1913) "No." Time, 2 sec. Introspection: "During the first moment the perception cleared up in my consciousness. I then found that the main features of the central region were present; they stood out easily in my attention. I especially noted the little blue object sticking up behind the central region ['blue' triangle]. I then noted the absence of the 'Chesapeake Bay' indentation, and automatically I said 'no.'"

Tefoq, Card 11 (March 18, 1913) "No." Time, 1.6 sec. Introspection: "The periphery of the figure,—the saw-teeth,—stood out

clearly in my attention, and also the plainness and whiteness of the background surface. It never stood out very clearly; I started to say 'no' before it had fully cleared up. I can not recall what the central region was like; I saw it only in a brief glance. I did not look for the 'Chesapeake Bay' indentation."

Tefog, Card 13 (March 25, 1913) "No." Time, 7.2 sec. Introspection: "At the very outset, I knew that the central part was wrong, but I could not tell what was wrong with it. The progress of my attention was blocked by it; I could not get beyond it, and I examined it part by part, beginning with the decoration upon the end which faced me. This possessed the points which I had observed in the original figures. My awareness of this was almost in the direct perception itself; but there was some comparison of it with schematic visual imagery of this decoration as it occurred in earlier figures. I noted next that the central part possessed depth, as had the central parts of the original series. I began an effort to call up the original figures; I could not recall all of them, and their presence did not seem to aid me. Very suddenly I discovered what the trouble was: I saw the central part inverted; I realized that the wrong end of the 'piano' was facing me. Just at this moment, I perceived that the triangular patch did not stick up from behind the central figure. My awareness that I was looking at the wrong end of the 'piano'* consisted in suddenly seeing the 'piano' turned about, nothing else in the figure being altered. Immediately my negative response followed."

Kareg, Card 1 (April 1, 1913) "Yes." Time, 1 sec. Introspection: "I observed the main outline, which seemed the same as the Karegs, and the fact that it possessed depth; my attention was particularly upon the lines which shaded the figure. My 'yes' followed immediately. After the exposure was terminated, my awareness of the lines continued in visual imagery; there was a vague unfamiliarity about them. The ease and rapidity with which my attention passed over the main form was the sameness; I did not call up a single visual image. The lines were a disturbing element."

Kareg, Card 4 (April 1, 1913) "No." Time, 1.2 sec. Introspection: "The figure lacked familiarity from the outset. It did not look like the other figures. This was present in the hesitancy with which I regarded the form and shape of the figure. While regarding this, I said 'no'; afterwards I was aware of imagery of the figures of the original series, but none of them possessed such an outline."

Kareg, Card 5 (April 1, 1913) "Ye-No." Time, 1 sec. Introspection: "At the very outset, I was aware of the shading and the sides of the figure. This stood out easily and I started to say 'yes.' Then I observed that no smaller right-hand part was present and I said 'no.'"

Kareg, Card 8 (April 15, 1913) "No." Time, 1 sec. Introspection: "First of all I perceived the angles at the top and at the bottom; I observed that the outline was cube-like, with one point facing me. My reaction 'no' followed immediately."

OBSERVER B

Zalof, Card 1 (November 18, 1912) "Yes." Time, 1 sec. Introspection: "At the outset, my attention fastened quite involuntarily

* A had previously likened this central part to an upright piano.

upon the center. I noted the presence of four component forms, my idea of fourness being present in four definite movements of my eyes. I next looked at the three branches of the figure, and noted the bifurcation at the ends, whereupon I said 'yes.' I then observed attentively the blueness of the center; immediately I was aware of a slight catch of my breath, which functioned as a questioning,—'must the Zalofs be red in the center?' I was then aware of a definite visual image of a Zalof of the original series, whose tentacles were similar to those of the card which I had just seen."

Zalof, Card 2 (November 18, 1912) "That is a Zalof." Time, 1.25 sec. Introspection: "My eye fastened upon the center first; then I noted the bifurcations at the ends of the tentacles, and then the tentacles themselves. The color did not reach focal attention until later. The whole gave me an impression of bigness, present in the extensity of my eye-movements themselves. I was aware of a tendency in the muscles of the left hand to twitch, as if to react by tapping; I then gave my verbal reactions. Apparently I did not have the proper reaction mechanism at hand."

Zalof, Card 3 (November 18, 1912) "No." Time, 2.5 sec. Introspection: "At the very outset I perceived that this was a pentagonal figure. My reaction 'no' followed immediately, and simultaneously my attention went to the center and I noticed that there were three main parts of the central body, but also three smaller ones. At the same time I noted the color of the center; this seemed to bring in a visual image of a member of the series, but one with distinct projections."

Zalof, Card 4 (November 18, 1912) "No." .75 sec. Introspection: "The fourness of this figure flooded in upon my attention; it came to consciousness in terms of oculo-motor innervations. I then noted that the branches terminated in bifurcations, and this was followed by a peculiar consciousness, which meant 'not on your life; you won't fool me.' This consciousness is hard to describe; it came out in my belligerent 'no.' Before I reacted I attempted to fixate upon the center; I got only a shadowy dim gray of a circular outline, but no clear impression."

Zalof, Card 6 (November 25, 1912) "That is not a Zalof." Introspection: "My attention went immediately to the inner parts, the outline being less clear. On the basis of the form of these parts I was aware of a tendency to say 'yes.' Their blueness did not seem to interfere with my affirmative tendency. My attention then went to the outline,—to the fact that the corners were smooth. A visual image of an arborized tentacle came up, with auditory imagery of my own voice saying the word 'bifurcation.' Then I was aware of vocal-motor verbal imagery of 'no Zalof,—has rounded corners' and I gave my reaction." (Describe your first affirmative tendency.) "This was partly a muscular innervation in my hand for tapping and partly a vocal-motor verbal 'yes' or 'that's a Zalof.'"

Zalof, Card 9 (December 5, 1912) "That is decidedly not a Zalof." Time, 1.9 sec. Introspection: "My attention went first to the general form, and to the fact that it possessed curves which had not been present in the Zalofs. It next went to the tentacles and I perceived that there was a bifurcation at the end of each tentacle. All of this time I was aware of a growing 'yes'-consciousness; this seemed to consist in a relaxation of my attention, having something to do with eye-movement. It was bound up with change in direction of atten-

tion and relaxation of strain. I then turned my attention in a rather voluntary fashion to the center. Immediately 'no' appeared to my consciousness in auditory and vocal-motor terms. My reaction followed."

Zalof, Card 9 (December 10, 1912) "That's no Zalof." Time, 1.5 sec. Introspection: "My attention went first to the center; and this was not right. I did not react immediately, but waited until my eyes had wandered over the periphery; the periphery was not satisfactory, although I was aware that the tentacles had a slight tendency towards bifurcation. My decision was made as soon as I obtained a clear perception of that center which lacked the three oval bodies. It was present in a tendency to turn away from the figure and to react; and I think I actually turned my head and body slightly. My awareness that the periphery was not satisfactory consisted in a dim visual image of the form of bifurcation which is characteristic of the original series; it seemed to come to my consciousness along with the visual perception of the tentacle. I was aware of a peculiar attitude of hostility; the Zalofs seem to be good to look at, and the other figures are to be cast out. This attitude was present only in the affective toning with which I threw it out."

Zalof, Card 10 (December 10, 1912) "Yes." Time, 3.2 sec. Introspection: "My attention fastened upon the center, where it remained; the central bodies were not clearly marked out. The figure was so small that I could not see whether there were separate central bodies. After a time I turned to the periphery; I was fairly certain that it was correct, but I investigated each tentacle in turn. My certainty was present in the relief from tension in my chest, shoulders and eyes with which I turned to successive tentacles, and finally back to the center. I was unable to detect more clearly the arrangement of the central parts. I was aware of a 'yes' consciousness,—auditory and vocal-motor of the word 'yes.' I then noted the very decided curve in each of the tentacles and was immediately aware of a visual image of the curve in the tentacles of the first Zalof of the series. The whole process presently dropped out of mind, and that meant that this characteristic was all right. Finally I was aware of a visual image of the tiny Zalof of the series, in which I had been unable to perceive four separate bodies in the center. Thereupon I gave my answer."

Zalof, Card 12 (January 14, 1913) "No." Time, 1.6 sec. Introspection: "Attention at the outset fastened upon the center. I examined it closely; I found that there were not four bodies in the center. My reaction followed immediately. As the curtain was falling the word 'smooth' came to my mind with a tendency to turn toward the corners of the figure; I can not remember now how these were formed, but I am certain that they were smooth and not bifurcated."

Zalof, Card 13 (January 14, 1913) "No, *ma'am*." Time, 2.1 sec. Introspection: "The figure cleared up in my attention,—all black. My fixation seemed to go out to the periphery; then I had to will my attention back to the center. This was very different from the others. I became confused; I had a peculiar bodily feeling as though I were suspended in the air. For a moment I lost my *Aufgabe*,—I forgot what I was to do with the figure. Then I think that I superimposed a visual image of a correct central form (uncolored) over the center of the percept; my knowledge that this was nothing like the Zalof came out in my 'no, *ma'am*.'

Zalof, Card 2 (January 21, 1913) "Yes." Time, 2.2 sec. Introspection: "My first reaction was negative; the blackness and the heaviness of the figure compelled my attention, striking me with a strange new feeling. This strangeness is difficult to describe; it involved a shallower breathing, a fixating, and a kind of a surprised 'no' in vocal-motor imagery, with an explosive innervation back of it. From this time on my attention traveled about the figure; I noted the general triangular form and the tentacles; I examined the center carefully and found four red bodies. Still my attention tended to fasten upon this heavy shading at the terminations and the feeling of strangeness persisted. Visual images of figures of the original series which contained decided variations in the shading came to my consciousness; at this point I was aware of a great deal of satisfaction and of a release of my attention from the heavy shading of the figure. My reaction followed."

Zalof, Card 15 (January 21, 1913) "No, sir." Time, 3.2 sec. Introspection: "My attention went to the general form of the figure,—the triangular body, which agreed with the figures of the series. Then my attention went to the central parts, which were properly composed of four bodies. Then my eye traveled along the periphery and I noticed the ends of the tentacles, which were entirely wrong; I realized this before any visual image of other bifurcations appeared. I was aware of auditory imagery of the word 'bifurcations' and of a sort of disgust; I then verified and compared my percept with visual imagery of one of the larger figures of the original series. My reaction followed." (Describe your consciousness that the triangular body agreed with the members of the original series.) "I was aware of imagery,—visual and other,—of being seated at the other apparatus and being shown the first member of the original series. The bodies were similar in the image and in the percept; my consciousness did not remain upon this feature, but floated smoothly to the next figure."

Zalof, Card 17 (January 27, 1913) "No." Time, 2.2 sec. Introspection: "My eye travelled over the contour of the figure, and it was correct; I noted the bifurcations, and the fact that my eye passed on without stopping meant that the form was correct. I was aware of pleasantness, and of a tendency to react with 'yes.' Then I looked at the center; the form of the central bodies was perfect. Then the word 'red' appeared, with questioning inflection, and my reaction was 'no.' Immediately several images of Zalofs in which the center was invariably red flooded into my consciousness."

Zalof, Card 5 (January 27, 1913) "Ye-e-s." Time, 3 sec. Introspection: "The bigness, and the coarseness of the figure seemed to give me a negative tendency. I was aware of verbal imagery of 'no.' Then I began a detailed investigation of the figure; my eyes went to the center, which was approximately correct, and then to the periphery. The periphery was right; my awareness of this came in terms of auditory imagery of 'bifurc—', the word remaining incomplete. Then my attention returned to the center and I looked at the three bodies which project in the direction of the tentacles; I could make these out although they were not very well differentiated. The middle body was there, and also not well differentiated. The color was proper. I gave a hesitating reaction."

Zalof, Card 17 (January 20, 1913) "It is. Oh, no! It isn't! It isn't!" Time, 11 sec. Introspection: "I became aware of the form on the first glance. It was pleasing. I glanced at the center; this

seemed to satisfy me, as my attention passed readily away. My glance went out to the tentacles; they were correctly formed. I reacted instantly. Then came a visual image of the figure, and I realized that the center was not red but black. My attention for the first time seemed to focus upon the center, and the word 'red' rushed in. My negative reaction followed immediately. Afterwards I was aware of visual memory-images of Zalofs with red centers, and of auditory imagery of having described the Zalof as always having red centers."

Zalof, Card 18 (February 6, 1913) "No." Time, .8 sec. Introspection: "My eye fell first upon the periphery; the tentacles had no arborized ends. My decision was ready at this instant; yet I was aware of a sort of inhibition which seemed to consist in a mechanical carrying out of my scheme of observation. My eye traveled to the center before I reacted. Immediately after my negative reaction, or with it, I was aware of a visual image of bifurcated ends which seemed to be superimposed upon the percept. The smoothness of the ends seemed to be a positive thing which simply entered consciousness and set off my reaction almost reflexly."

Tefoq, Card 5 (January 27, 1913) "No." Time, 1.4 sec. Introspection: "My attention went in turn to the periphery, to the blankness of the circular background and to the end of the central part. I was aware of visual imagery of the irregular leaf-like form of the periphery in one of the original Tefoqs. My attention riveted upon the white blank end of the central 'steps' [the angular central figure] and my 'no' followed immediately. I think that 'hi—,'—the first of the word 'hieroglyphic' [B's name for the little irregular design in the center of the angular central figure] came to consciousness in auditory imagery, or in a setting of my mouth for pronouncing the sound; this was very, vague and non-focal."

Tefoq, Card 1 (February 3, 1913) "Yes." Time, 5 sec. Introspection: "My attention went first to the stair-step central figure. This was all right. My regard then passed to the indentation in the lower periphery and followed around the periphery. I then noticed the design in the end of the central part and this was likewise correct. I was aware of a tendency to react, which was immediately followed by focal attention upon the figures on the background part. This attention was accompanied by a parting of my lips, an in-take of breath, and a leaning toward the card. Presently I was aware of a visual image of a member of the original series, in which much shading was present in the background part of the figure. Then I turned to my essential features once more, and went over them three or four times, noticing the design on the end of the central figure, the periphery, etc. All of this time the figures on the background of the percept were prominent in my consciousness. Finally I dragged myself to react."

Tefoq, Card 3 (February 3, 1913) "Yes." Time, 2.2 sec. Introspection: "My eye first fell upon the form of the central part of the figure. The word 'green' came to mind. My attention passed easily from this central region, and I noticed the blue triangle, from which my attention again shifted easily. I observed the design in the end of the central part and said 'yes.' The outline was in the fringe of my consciousness throughout."

Tefoq, Card 4 (February 10, 1913) "Yes." *No!!* Time, 2.2 sec. Introspection: "My attention passed over the central part of the figure; during its course, the following verbal imagery appeared, in

vocal-motor terms: 'steps washed in green,' 'triangle blue,' 'design,—' then 'yes.' Afterwards I was aware of a visual image of a figure, in which my attention was upon the lower outline and upon the absence of the indentation. Immediately my 'no!!' followed. Before or during this 'no!!' I had very good visual imagery of several indentations in their proper form."

Tefoq, Card 6 (February 17, 1913) "Yes, that is a nice little Tefoq." Time, 1.8 sec. Introspection: "I noticed at the outset the relative smallness of the stair-step form and the bigness and blackness of the outline. This was followed by a rigidity of body which constituted a somewhat negative reaction. My attention then went to outer parts of the figure, and I was aware that these corresponded to my definition of what the outline should be. The word 'inset' occurred in auditory imagery of my own voice, and I was satisfied as far as the periphery was concerned. I was then aware of auditory and vocal-motor imagery of 'green wash' and I noted its presence. I then noted the tiny blue triangle and the design in the end of the central part. I drew a little closer and was aware of pleasantness, just before I voiced my decision."

Tefoq, Card 7 (February 17, 1913) "No." Time, 1.4 sec. Introspection: "At first my attention went to the inset in the lower periphery, then to the green wash on the side of the central body and then to the bright blue triangle. I was aware of an affirmative tendency, and almost had vocal-motor imagery of 'yes.' Then my attention fell upon the curve, where there should have been sharp corners. I was aware of a decided shock, and of kinaesthesia of closer scrutiny on this feature. Then I reacted with 'no' before I observed whether or not the design was present in the end of the central figure. I think there was no design."

Tefoq, Card 10 (February 17, 1913) "Yes." Time, 3.6 sec. Introspection: "At first I was aware of extreme interest in the figure. I glanced it over quickly, and from this moment there was a consciousness that in spite of the strangeness of the figure, it would turn out to be all right. This consciousness, I think, consisted in a quick grasping of all of the essential features. Then I began deliberately noting each detail; first of all the outline. Before my attention went to the other details I had a visual image of one of the Tefoqs, in which the central part extends beyond the right periphery; and also auditory recall imagery of having mentioned to you that the outline need not include the whole of the step. The auditory imagery was not clear and detailed. Then my attention went to the 'step' (central figure) itself. I noted that the form and color was right. 'Green' was present in auditory and vocal-motor terms. I noticed the outline and the design in the end, and then came my reaction."

Tefoq, Card 11 (February 24, 1913) "Yes." Time, 2.6 sec. Introspection: "At the start I was aware of dissatisfaction. I could not remove my attention from the periphery; it remained there, and at the time I was aware of a certain amount of tension in my chest, eyes and forehead. I seemed to drag my focus away from the periphery by main force. I then turned to the central figure and began going over my criteria,—the greenness, the blue triangle, the design in the end of the steps. Then my 'yes' followed."

Deral, Card 1 (March 3, 1913) "No." Time, 1.9 sec. Introspection: "My attention went over the entire form of the figure and the foot on the right-hand side and the humps; at the same time I was

aware of a visual image of the first Deral which had about the same size and form as the present figure. The word 'fish' was also present. What was most focal in my mind at first was the visual perception of the form, the immediate and ready slide of the attention from one figure to the other, and the absence of a tendency to hesitate or to make comparisons. At the close of this survey I started to say 'ye—', that being present in vocal-motor imagery. Then my eyes went to the left-hand figure, and the word 'black' appeared; hesitation followed, and then the words 'not colored,' and then visual imagery of colored figures."

Deral, Card 2 (March 13, 1913) "Mm—hm."⁵ Time, 3 sec. Introspection: "My first tendency was negative. The 'Mm—hm' started to be 'Mm—mm.' At this time my attention was on the red color; and clung tenaciously to that color. Instead of giving the negative reaction, I busied myself with the other features; I found myself going over the figure very carefully. I first noticed that the right-hand figure had cilia. Then I attended to the outline of the right-hand figure and I was conscious that the cilia ran all about the periphery. I noted the smoothness of the left-hand figure; then my eye passed downward to the bottom of the left-hand figure and I noted that it stood on a triangle. At this time I was aware of auditory imagery of 'triangle at the bottom.' The bright red coloring was clear in my consciousness. My attention then went again to the form of the right-hand figure, in order to note whether the right-hand side had a bowed form. I found that it did. Still, my affirmative reaction was inhibited. The figures did not seem to stand at the same angle as the rest of the figures. This occupied my attention for a perceptible length of time. Finally I reacted affirmatively." (Describe your statement in order to note whether the right-hand side had a bowed form.) "My observation of the outline of the right-hand figure was initiated by a visual image of a member of the series in which that outline was bowed."

OBSERVER C

Zalof, Card 1 (November 23, 1912) "No." Introspection: "My attention went to the triangular form and the three branching-off processes with the fibroid processes at the ends. When I looked at the blue color, I was aware of some hesitation regarding my own definition and of wondering whether color should have been made an essential element. My observation of the triangular arrangement was attended by a vague visual image, the form of which was defined not by lines, but by something kinaesthetic, of the nature of empathy; I was aware of a feeling of being stretched out like a starfish; this consisted in a slight pull of my shoulder muscles and a feeling of the center being located in my chest. It was very fleeting. My wondering whether the definition should have made color an essential element was for the most part present in vocal-motor verbal terms, to the effect that the definition might well include only the triangular arrangement and the branching processes, and leave out the matter of color. I had a vocal-motor tendency to use the phrase 'too obvious,' meaning that my definition was too obvious when based on color. This consciousness was not definitely evolved at the time; it was simply 'too obvious.'" (What was the immediate antecedent of your reaction 'no?') "It was focussing on the part of the figure

⁵ 'Mm—hm' is a colloquialism of affirmation, 'mm—mm,' of negation.

colored blue. From the very first I had been aware of a negative attitude; it was rather definitely localized in the muscles between my eyes, as if I were squinting and wrinkling my forehead. There was also a slight unpleasantness, although 'strain' expresses the consciousness better. Then came the consciousness that I would like to revise my definition."

Zalof, Card 2 (November 23, 1912) "Yes." Introspection: "I was aware of a fragmentary and unclear empathic kinaesthesia or attitude, similar to the one which I described in connection with the first card (card 1). The vocal-motor 'yes' came before I spoke, and it followed very closely upon the kinaesthesia."

Zalof, Card 3 (November 23, 1912) "No." Introspection: "The processes were very fleeting. I had a tendency to say 'no,'—strains in my throat muscles,—immediately after you exposed the figure. Then came a sort of internal 'why,' partly vocal-motor. Then voluntarily my attention moved around the figure, following its outline; there was a feeling of no angles, present particularly in vocal-motor terms of 'angles' and partly in a kinaesthesia of eye-movement. At the end of this survey of the thing, my reaction 'no' occurred. The first 'no' was much more vivid and intensive than my finally-spoken 'no.'

Zalof, Card 4 (November 23, 1912) "No." Introspection: "I was aware at the outset of a visual image of the words 'no red,' in my own handwriting, held off at a distance; and also of a kinaesthetic pull over to the left. My feeling of empathy recurred, but its balance was disturbed by a pull to the left. Then, with voluntary attention, I fastened my eyes upon the center of the figure; then came a vocal-motor tendency,—that bally definition.' I was aware of unpleasantness; and a vocal-motor 'no' grew up slowly, beginning with a sensation of pressure at the lips and with a slight bending over toward the right side. Then came a kinaesthesia at the back of the tongue, which held for an appreciable period of time. Then 'no' was pronounced slowly. This feeling of disturbed balance and unpleasantness persisted throughout; when I gave my reaction it disappeared."

Zalof, Card 6 (December 6, 1912) "No." Time, 1 sec. Introspection: "My attention went to the general form of the figure, and the following vocal-motor verbal process went on: 'general form has no distinct off-shoots; points are not equidistant from center; color blue; background covered with dots, no repetition, in center, of general pattern of off-shoots from periphery.' This vocal-motor process was to some extent innervation,—'blue' came out,—but it was mostly a feeling of strain and slight tongue movements. I was also aware of kinaesthesia in my left hand of pointing to the dots; they impressed me as being new, and their newness consisted in their visual clarity itself and in this kinaesthesia."

Zalof, Card 7 (December 6, 1912) "Yes." Time, .9 sec. Introspection: "I was aware at first of a visual image of a larger pattern of this same stimulus, and my affirmative reaction came immediately after this image; it appeared first in the form of a slight bending forward at the back of my neck, and the vocal-motor 'yes' came immediately. After I had pronounced the 'yes' I was conscious of the fact that my attention to the stimulus had been concentrated entirely upon the periphery of the design. This was known in terms of a recurrence of kinaesthesia of eye-movement which had been

present during my observation of the figure; a vocal-motor strain,—“why didn’t you look in the center?” appeared, together with a visual image of a large, thickened center formation. Afterwards came a visual image of the center of the stimulus, which was merely red; all I could get was the color, and not the form. Along with it came a kinaesthesia of fixing my eyes upon the center, and a faint unpleasantness.”

Zalof, Card 8 (January 31, 1913) “Yes.” Time, 1.3 sec. Introspection: “I observed in turn the outlines of the central part, the red color, and the three main arms. With this came a kinaesthetic feeling of assent in the back of my neck,—a kinaesthetic image of nodding.”

Zalof, Card 9 (January 31, 1913) “No.” Time, 1.2 sec. Introspection: “My attention went to the lumpy, irregular outline, the blueness, and the ends of the tentacles. With my attention to the form of the ends of the tentacles, my negative response began, as simply the closeness of my attention. Just as I said ‘no’ I was aware of a definite visual image of a large, very simple Zalof.”

Zalof, Card 11 (February 18, 1913) “Yes.” Time, .8 sec. Introspection: “I first focused upon the center of the card. There was a quick upward eye-movement, and vocal-motor imagery of ‘two arms.’ Immediately the reaction followed.”

Zalof, Card 13 (February 18, 1913) Shakes head. Time, 1.4 sec. Introspection: “At the very outset I was aware of a vocal-motor tendency to react ‘yes,’ followed by an inhibition which took the form of a tongue movement; at this time I had a feeling that something was absent, and then the reaction ‘no’ appeared in vocal-motor terms. I gave the reaction, and then came a vocal-motor verbal image of ‘red’ and a visual image of a red splotch with a vocal-motor ‘Zalof.’ My feeling of something absent seemed to be a concentration upon the center of the figure.”

Zalof, Card 5 (February 25, 1913) “Yes.” Time, .8 sec. Introspection: “My attention focused upon the upper right-hand arm, the rest of the figure being present in peripheral vision. ‘Yes’ came up in vocal-motor imagery, and my reaction followed immediately.”

Kareg, Card 2 (March 11, 1913) “No! Mercy, that’s funny!” Time, 3 sec. Introspection: “At the very first I was aware of a strong tendency to react ‘yes,’ present in considerable innervation, and moving of the tongue. My attention then centered upon the connecting structure, and I was aware of a strong kinaesthesia in my neck of having my head bent in the position of the figure. This was unpleasant. At the same time I was aware of a visual image of a clam with its protruding neck bent down. Just before I reacted I had a visual image of the printed words ‘in spite of’ and some awareness of ‘in spite of strong resemblance.’ The words ‘strong resemblance’ were present in faint vocal-motor terms. My reaction followed. The head of the figure ought to go out straight instead of being bent down in a curved line as it was in this figure.”

Kareg, Card 8 (March 25, 1913) “No.” Time, 2.4 sec. Introspection: “I noted the form of the figure, with the awareness that the large body was on the right-hand side. I was also aware of a visual image of the turtle-like Kareg [of the original series], the large portion of the figure being on the left; at the same time came the vocal-motor imagery of ‘they are all like that.’ My eyes were focused on the figure on the left where they tended to remain. A

vocal-motor strain for saying 'no' appeared and then the spoken reaction itself."

Deral, Card 1 (April 15, 1913) "Yes." Time, .8 sec. Introspection: "My attention went to the lower part of the right-hand figure, and then the line of regard moved upwards obliquely in a broad bend to the upper left-hand part of the figure. At the angle in the line between the left and right-hand figures I was aware of a slight kinaesthesia of a hitch or jerk, and then of satisfaction. This constituted a consciousness that my oblique line of regard had taken in all of the angles which I had discovered in the figure. (At present I am not at all sure that it did.) My reaction followed immediately."

Deral, Card 4 (April 15, 1913) "No." Time, 4.2 sec. "As I observed this figure, I was aware that it was tilted, that it did not stand square. I had a kinaesthesia of whirling and dizziness and of decided tilting of my whole body, of my head being nearer the ground than normal. The kinaesthesia came towards the last of my observation. My negative reaction followed."

Deral, Card 8 (April 15, 1913) "Ye-e-es; I don't know." Time, 1.2 sec. Introspection: "My first perception of the figure was followed by a feeling of balance, a consciousness that the figure had the proper attitude. This kinaesthesia of balance was strongest in my right hand, and it consisted in a sense or awareness of taking hold of the figure and settling it squarely, in an upright position. Immediately I said 'yes,' afterwards I was aware of a lingering focus upon the upper right-hand part of the figure which seemed to have a finger-like structure not present in the Derals. I dwelt upon color in my primary memory image of the figure; I was aware of hesitation and of a vocal-motor image of 'color?' with decided questioning inflection."

Deral, Card 1 (April 29, 1913) "Yes." Time, 12 sec. Introspection: "At the outset I was aware of a strong tendency to react negatively. This came as a vocal-motor image of 'no' and a kinaesthetic tendency to focus upon the uncolored left-hand side of the figure. Then came a kind of focusing both of my eyes and of the direction of my head upon the lower part of the figure. A visual image of one of the Derals which I had just been shown came up rather clearly; I was aware that there was no color in my percept and that certain typical angles were present in both percept and image. [During the previous exposure of the series, I had had a vocal-motor experience of dividing the Deral into two types, as regards the angles; in one type the acute angle is very acute, and is lower in the figure; in others, it is less oblique, and further up in the figures.] A vocal-motor image of 'acute angle' now occurred, and a wave of recognition which consisted in a strong affective toning, —pleasure, with a strong gasp outward,—and considerable empathy of sharp bending or contraction. Then came a definite affirmative kinaesthesia in my head, of nodding, and in my hand of a waving gesture. The vocal-motor verbal image of 'yes' appeared. Then came the reaction; afterwards I was aware of strong negative and strong affirmative tendencies which seemed to project themselves respectively into the two sides of the figure. I had a visual experience of seeing a series of schematic lines on the left which meant no and another one on the right which meant yes."

Deral, Card 2 (April 29, 1913) "Yes—no!" Time, 2.8 sec. Introspection: "My attention went to the color. After my initial focus

upon color, I was aware of a lapse in consciousness, of a sort of a break with no sense of the problem. At this time I had an affective toning of interest. Then I focused my attention on the left by a voluntary effort which appeared in a kinaesthetic shock. A vocal-motor image of 'acute' occurred, as well as kinaesthetic and visual imagery of balancing. I had a visual image of a figure as if hanging in space, the acute angle being supported by a wire and the two halves of the figure balancing perfectly. At the same time I had a kinaesthesia of balancing myself which was localized in the arms and hips. Then a vocal-motor verbal process 'belongs to first type.' Then my reaction 'yes.' Then the figure was withdrawn; my eyes looked downwards. Presently came a strong visual image of the first figure I had seen. I saw clearly the lower part of the figure and noted that the lower extremities of the two halves were separated widely. At this I was aware of a feeling of great strain in my eyes, as if they were diverging; my focus changed from the floor, with an almost painful feeling of my eyes being stretched apart. The kinaesthesia was actually stronger than the sensation of the change of focus. Immediately I said 'no.'

Deral, Card 5 (April 29, 1913) "Yes." Time, 1 sec. Introspection: "My attention went to the base of the right-hand side. I was then aware of kinaesthesia of my eyes moving up the line adjoining the two halves; this was a muscular pull of my eyes following the line. Therewith I had a familiarity,—a memory of a movement like that in the past. The kinaesthesia was an immediate sort of a thing, an easy sensation, as a repetition of a movement made very recently. My reaction followed."

Deral, Card 12 (April 29, 1913) "Yes—not sure." Time, 1.2 sec. Introspection: "I based my decision upon the correct position of the foot. At the very outset my attention focused upon the lower right-hand part. This focusing was followed by my reaction 'yes.' After the figure was withdrawn, a visual image of it persisted. My attention in the image went to the union between the right-hand and left-hand sides; I do not think that the right-hand figure is inserted far enough into the left-hand figure. After my 'yes' a vocal-motor 'no angles' followed, attention passing to a visual image of an acute angle running into a mass of something. The acute angle was clear, but the mass was foggy and cloudy."

OBSERVER D

Zalof, Card 3 (November 27, 1912) "It is not." Introspection: "I was aware of a visual image of one of the figures of the series, as soon as my eye fell upon the exposed figure. The image had a compact form, similar to that of the present figure; it was perhaps the seventh or eighth member of the Zalof series. I found my eyes moving about the margin of the exposed figure, and with the movements I counted the sides,—'one, two, three, four, five.' The sides were not sharply differentiated, but the arrangement was pentagonal. As soon as I became aware of this fact,—the counting, the pentagonality,—my negative response followed of itself."

Zalof, Card 5 (November 27, 1912) "It is." Introspection: "As soon as my attention fell upon the figure which was exposed, I had vague and fleeting visual images of several members of the original series. None of these images represented compact figures; all of them had elongated projections. I was aware of slight pleasantness, and my affirmative response followed. Immediately afterwards, I

was aware of doubt and unpleasantness, together with an awareness that the terminal projections did not agree with those of the members of the series. This last awareness consisted in fleeting visual images of the terminal processes of the original series, together with an awareness of the fact that the processes which I perceived did not correspond. I was aware of vocal-motor imagery of the word 'flipper,' as I attended to the visual images of the projections which I had just perceived; they were more like flippers than they were like the projections of the original Zalof figures."

Zalof, Card 7 (December 4, 1912) "It is." Time, 1.8 sec. Introspection: "I was aware at the outset of a rapidly alternating series of visual images of three of the original series. One of these images had very long arms, and I could see the pair of branches at the end of each arm. Another had arms of intermediate length. The third was much more compact than either of the others. All of this time I was conscious of the general shape of the present figure, and of its pair of terminal branches; my attention alternated rapidly between the percept and the imagery. My eyes passed in this way from the center to each terminal process, and I found that the paired arrangement was present in every case. I was aware of slight pleasantness, but of no intensive degree of strain or tension. Immediately after completing the fixation upon the ends of the branches my response came involuntarily."

Zalof, Card 9 (December 4, 1912) "I am somewhat in doubt." Time, 3.25 sec. Introspection: "First of all, I observed the general shape of the figure.—the fact that it had three arms. My attention went to the ends of the arms, and I found that smaller branches were present, and grew out of the two sides of each end; hence they exhibited a bi-partite arrangement. But I also observed that the arrangement was not that of a forking pair of branches at the end of these end-arms. I was aware of hesitation; I looked over the figure several times, always coming back to the ends of the branches, where I observed the bilateral arrangement of the terminal processes. I had a visual image of the first card, which clearly contained the common characteristics. Presently I said 'I am in doubt.'"

Zalof, Card 10 (December 4, 1912) "It is unmistakably a Zalof." Time, 2.45 sec. Introspection: "I was clearly aware of sweeping my eyes first to the upper left-hand corner, then to the right-hand corner, and then to the lower side; in each case I observed that the terminal pair of branches was present. This fact was in the focus of my consciousness. I was less clearly aware at the time of the triangular form of the figure, and also of the fact that the figure was very irregular. I was aware of no pleasantness or unpleasantness and of no tension. The dominant thing was the fact of the terminal branches; and I responded affirmatively."

Zalof, Card 2 (December 11, 1912) "It is." Time, 3.75 sec. Introspection: "I had not a high degree of certainty. First of all I observed the triangular form, then the bi-partite arrangement of the terminal arms. I was briefly aware of red coloring. Most of the time my attention was devoted to observation of the terminal processes. This observation was accompanied by a *Bewusstseinslage* of doubt and hesitation; and finally I found that I had responded affirmatively, without having deliberately made up my mind to do so. I believe that my lack of certainty was due to a doubt as to how many processes must be present at the ends of the branches

of the Zalof figures." (Describe your *Bewussteinslage* of doubt.) "This consisted in a complex mental process which was dominately emotional in character and describable in some such terms as doubt, uncertainty, confusion and the like." (What was the emotion?) "Neither of the terms pleasant nor unpleasant does justice to the facts." (What other contents were present?) "As I remember it, the affective component was unpleasant; the other components of uncertainty and hesitation I can not now describe fully."

Zalof, Card 8 (December 11, 1912) "It is not." Time, 3 sec. Introspection: "My first glance at the figure revealed its general form. Then my attention concentrated upon the terminal arborizations, and I was distinctly aware of passing my regard from one corner of the figure to another, and of pausing at each corner to examine the number and arrangement of the terminal processes. I found the arrangement to be perfectly regular, and in fours; moreover, the minute terminal arborizations which I found in the original figures were now lacking. My consciousness of the regular arrangement and of the absence of minute terminal arborizations was followed by my negative response."

Deral, Card 1 (February 12, 1913) "Yes,—it all depends upon what is the color of the left-hand side." Time, 8.4 sec. Introspection: "I was aware of looking for certain characteristics,—the notch, the straight side, the color, and the further extension in a posterior direction of the colored side. My awareness of these characteristics was present in vocal-motor verbal terms. I found all of them excepting color; at first I was aware of a tendency toward a negative reaction; this was an emotional sort of a thing which I can not now describe. Then there appeared a series of vague and sketchy vocal-motor images of which the following is the purport: 'Yes, it is gray; but I think I can find a little blue in that gray, so I will say yes.' The verbal imagery was much more vague and sketchy and fragmentary than these words indicate. My attention was on the left-hand side of the figure."

Deral, Card 4 (February 19, 1913) "No." Time, 5 sec. Introspection: "I was aware of an *Aufgabe*,—a definite set or tendency,—to look for color on the left-hand side. I noted that this side was white but there was no tendency to react. My eyes swept to the other side which I saw was colored, a violet color; again there was no tendency to react. I began to seek for confirmation of other characters; the rectilinear 'snout' region at the base of the right-hand side attracted my attention. From the 'snout' characteristic my attention returned to the left-hand side; I was aware of a slight shock when it proved to be gray. My negative response followed."

Deral, Card 5 (February 19, 1913) "No." Time, 6.6 sec. Introspection: "I was aware of an *Aufgabe*,—a tendency to look for color on the left side. I found color in this region. Next I observed the two rectilinear sides; I was conscious of them only for a moment. My attention was next attracted to the right-hand side, where I became aware for the first time that the hairs were absent. I then tried to remember whether hairs were always present in the original figures; this consisted in a tending to say, repeatedly, 'did it have hairs?' I almost spoke these words aloud. Before the problem was settled my attention was attracted to the blotches on the right-hand side of the figure and I reacted immediately in negative fashion."

Deral, Card 8 (February 26, 1913) "It is not." Time, 3.2 sec. Introspection: "First of all, I noted the presence of hair around the border; and I tended to react affirmatively. As far as I can remember, this tendency consisted in an internal and organic welling-up; it also consisted in a tendency to reach out my right-hand, which was lying in my lap. My attention then went to the left-hand side, where I found the rectilinear edge. My attention paused. It then swept back to the right side which I found to be colored. The next thing I knew I had reacted negatively."

Deral, Card 11 (February 26, 1913) "Yes, I think so." Time, 7.4 sec. Introspection: "First of all I examined the color, then the rectilinear side on the colored half, and then the short rectilinear side at the base of the uncolored half. I next noted the dots on the uncolored half and examined these very carefully, noting that they were dots and not hairs. Finally I reacted positively with much confidence; this confidence consisted largely in pleasantness. As soon as I had reacted, I remembered visually that this figure had possessed no cilia; immediately I added 'I think so' to my response."

Deral, Card 12 (February 26, 1913) "Yes." Time, 5.6 sec. Introspection: "First I attended to the hair on the right side. Then I looked at the left-hand side. I found numerous short hairs in parallel rows. Then I attended to color, and then to the rectilinear 'snout' at the base of the right-hand side. All of this time I was aware of an increasing feeling of pleasantness; and finally I found that I had reacted with a good deal of confidence. Afterwards I remembered that I had failed to note whether the notch was present and also the long straight side in the left-hand periphery."

Deral, Card 13 (April 16, 1913) "Yes." Time, 6 sec. Introspection: "My attention went first to the left-hand side; I remember that it was blue and very much smaller than the right-hand side. I was next aware of a series of three visual images of figures which I have seen in the original series, together with vocal-motor verbal imagery of 'rectilinear side.' Then followed a period of hesitation, during which each of these visual images was in turn compared with my perceived figure,—*i. e.*, each image was in turn projected beside the objective figure. I found in each case that both image and percept possessed two rectilinear sides; in each case the coloring was on the appropriate half. Finally I found that I had reacted affirmatively."

Deral, Card 17 (April 16, 1913) "I am in doubt." Time, 4 sec. Introspection: "I first observed the left-hand side and found it colored; my regard then passed to the right, which I found to be covered with dots. I then noticed the rectilinear side of the anterior region of the left-hand part. My regard then swept to the right and I observed the lower rectilinear side. As yet I was aware of no tendency to react affirmatively. Then my eyes swept back and I found that the median line was rounded and not pointed as it usually is. I hesitated, and finally replied 'I am in doubt,' because I could not remember whether the notch must always have a point." (Describe your hesitation.) "I was not aware of visual images. My hesitation simply consisted in a tense uncertainty and suspense, which was unpleasant. It was not a bodily tenseness."

Deral, Card 18 (April 16, 1913) "Gee whiz! I am in doubt." Time, 8 sec. Introspection: "My attention was first attracted to the colored half, where it was held for a moderate interval. My regard then swept across the figure, and I noticed that the other half was

uncolored. I observed next the two rectilinear sides and then the notch. I became aware of doubt and tenseness; presently my regard and attention returned to the colored left-hand part. I was aware then of hesitation, which amounted almost to a mental paralysis; my regard could not be moved, and an inhibition of some sort occurred. I was not aware of any effort to compare the colors with those of the members of the Deral series, nor was I aware of any verbal imagery of 'uniform color' and the like. My awareness of the color was accompanied simply by this mental tension and unpleasantness. I then gave my reaction."

Kareg, Card 3 (March 5, 1913) "Yes, I think so." Time, 10 sec. Introspection: "First of all my attention was attracted to the left-hand part. I then saw the polylateral form, but I observed that one of the sides was concave. This concavity attracted my attention for a considerable time, and my observation of it was accompanied by slight tension and unpleasantness. My eyes then swept to the connecting section and then to the right-hand part. Presently they returned to the concave side. I noted the greater thickness at the center than at the periphery, and finally responded affirmatively, my uncertainty having to do with the concave side."

Kareg, Card 5 (April 24, 1913) Observer turns away. Time, 1 sec. Introspection: "My glance fell first upon the region of the left-hand side, which ordinarily adjoins the upper boundary of the connecting part. From this point I started to count; and I saw that the rest of the figure was lacking. Nevertheless, I later continued my counting; this may be explained perhaps by the fact that the sides were so well-differentiated. I was clearly aware of the presence of six sides."

OBSERVER E

Zalof, Card 2 (November 18, 1912) "Yes." Introspection: "My attention went in turn to the triangular body, the limbs, and the red nucleus. In each case, my impression was accompanied by a vocal-motor verbal image, in the first case of 'triangular body,' then 'three limbs breaking up at end,' and finally 'red nucleus.' At the time of my observation of the central nucleus, I had a visual image of the central parts, the circle surrounded by the pear-seed-shaped bodies. When that came up, I unhesitatingly said 'yes.' Almost from the beginning I was aware of a tendency to react 'yes,' in vocal-motor terms."

Zalof, Card 3 (November 18, 1912) "No." Introspection: "As soon as my regard fell upon the exposed figure, I was aware of a vocal-motor verbal image of 'three limbs branching at end' and also of a visual image of a member of the original series, which had three long limbs. I then had a vocal-motor tendency to react 'no.' Then I became aware of the nucleus; I observed this long enough to see that it contained five parts. My negative reaction followed."

Zalof, Card 4 (November 18, 1912) "No." Time, .75 sec. Introspection: "At the very outset I was aware of a vocal-motor image of 'three limbs,' then my perception of the figure became clearer; almost immediately I had a vocal-motor image of 'four limbs' and also an image of 'no red nucleus.' My 'no' followed upon my perception of the four limbs."

Zalof, Card 7 (November 25, 1912) "Yes." Introspection: "At the very first moment, I decided that the figure was a Zalof. This

decision followed upon my perception of the general form and the red nucleus, and it consisted in a comparison of my percept with a visual image. A vocal-motor 'yes' appeared, but was inhibited by a closer observation of the nucleus. The visual image became clearer in consciousness than my actual percept, and I was aware of turning my attention from the visual image to the percept, and of examining the nucleus. This examination was difficult on account of the small size and indefinite drawing; but after I had observed the center, I decided that it was a Zalof and responded with 'yes.' Just before the stimulus disappeared I noted that each arm split into two terminal divisions. I was aware of a vocal-motor image of 'three arms.'" (Describe your first visual image.) "It was similar in form to the stimulus. It was a vague sort of a thing, and had rather long tentacles. My first vocal-motor 'yes' occurred before this visual image became very clear in consciousness." (Describe your last decision that it was a Zalof.) "This was nothing more than comparison with my visual image."

Zalof, Card 8 (November 25, 1912) "No." Introspection: "I observed the shape of the figure,—the triangular body, the three tentacles,—and was aware of a vague visual image of a Zalof. With my awareness of the form, I had a vocal-motor image of 'yes.' My eyes then focussed upon the nucleus, and the visual image cleared up with respect to its nucleus. A vocal-motor image of 'not similar' occurred. The rest of the time before my reaction was taken up in an examination of the center of the stimulus, in an effort to find whether anything occurred similar to the center of the image. The lines in the center of the stimulus were confused, and I could not be sure as to the nature of the central parts. My examination was accompanied by strain, which was localized in my eyes and forehead; I finally found that the perception did not correspond to my visual image, and I reacted negatively."

Zalof, Card 10 (November 25, 1912) "Yes." Introspection: "My awareness of the shape of the stimulus was accompanied by a visual image of a very long-armed Zalof. The stimulus had no triangular body; it was all arms, and I was aware of a tendency to say 'no.' My attention shifted to the nucleus, which I had difficulty in observing; I was aware of strain in my eyes and brow, and of a forward movement of my body. A visual image of a nucleus appeared; the image and the percept corresponded, my attention being primarily upon the nucleus. I was aware of unpleasantness, and finally of vocal-motor imagery of 'very ugly.'"

Zalof, Card 6 (January 13, 1913) "No." Time, 1.6 sec. Introspection: "My attention went first to the general shape, and I was aware of a vocal-motor image of 'no.' Immediately this was inhibited, the inhibition consisting in the appearance of a vocal-motor image 'see nucleus.' Then I observed the nucleus, and was aware of vocal-motor images of 'blue' and 'long-shaped.' My negative reaction followed."

Zalof, Card 14 (January 13, 1913) "Yes." Introspection: "First of all my attention went to the nucleus. I found that the three apple-seed-shaped bodies were not separated and I hesitated upon this feature. Then came a vocal-motor image 'look at rest,' and I was aware of an attitude of desiring to exclude the figure on the basis of other characteristics, but of being reluctant to exclude it upon the basis of the nucleus alone. My attention went to the other features, and presently I was aware of a verbal image, vocal-motor, of 'rest right.'

My fixation returned to the nucleus, and the verbal imagery appeared 'can not throw it out on that.' My affirmative reaction followed." (Describe your attitude.) "I was aware of uncertainty about the nucleus; I could not clearly distinguish its parts. My attention then went to other parts of the figure."

Zalof, Card 17 (January 25, 1913) "Yes." Time, 2.6 sec. Introspection: "My attention went first to the pseudopodia. I was aware of a vocal-motor image 'arms right; are branched.' My attention then shifted to the nucleus. Then came a vocal-motor image of 'right shape; not red,' followed by 'doesn't need to be.' Then came my affirmative reaction."

Zalof, Card 13 (January 27, 1913) "No." Time, 2 sec. Introspection: "At the outset my attention happened to fall upon the nucleus, and I was aware of a vocal-motor image of 'no nucleus.' My reaction 'no' followed before I noticed the extremities at all."

Deral, Card 3 (December 9, 1912) "No." Time, 1.75 sec. Introspection: "My attention went to the central part of the uncolored side. The vocal-motor verbal image 'no point' occurred; then came the vocal-motor image 'one orange.' A visual image of a correctly pointed central line occurred. I observed that the central line between the two halves of the percept bulged toward the left. Toward the close of my observation I was aware of strain in my forehead, and of mild unpleasantness. My reaction followed. Vocal-motor imagery of 'ugly' occurred."

Deral, Card 5 (December 16, 1912) "Yes." Time, 5.6 sec. "I was aware of a series of rapid changes of fixation, or at least of attention, and as my regard fell upon a part of the figure I named it in vocal-motor images. The vocal-motor images were as follows: 'point,' 'blue,' 'square edged,' 'pseudopodia.' Then came a vocal-motor 'yes' which was not inhibited." (Were you aware of any 'yes' attitude before your inhibited 'yes?') "Yes. After my verbal image of 'blue' I was aware of a vocal-motor image of 'yes' which persisted."

Deral, Card 7 (December 16, 1912) "Yes." Time, 2.75 sec. Introspection: "I had great difficulty in observing the figure, because it was so small. I was aware of straining forward. My attention shifted without shifts of fixation; as it fell upon certain parts of the figure, vocal-motor images appeared. They were as follows: 'right pointed,' 'left notch, colored,' 'straight edge,' 'pseudopodia off.' Somewhere during this process the vocal-motor image 'yes' occurred which was inhibited by my attraction of attention to other features. I was also aware of vocal-motor imagery 'very small,' and then of 'size does not matter.'"

Deral, Card 9 (January 11, 1913) "Yes." Time, 12.25 sec. Introspection: "At the very first, I was aware of a vocal-motor image of 'yes,' which was inhibited by my effort to find a well-defined straight line in the lower left periphery of the figure. This line was straight, but it did not break off sharply, as it should. The rest of my observation consisted in a series of vocal-motor images, representing an argument as to whether I could decide that the lower line was straight enough to call the figure a Deral. I also verified my other elements, in shifts of attention and corresponding vocal-motor verbal images. The following were the images: 'left colored, right not,' 'pseudopodia,' 'point,' 'notch.' My attention then returned to the lower left." (Describe your vocal-motor verbal argu-

ment.) "I can remember the following verbal images: 'isn't square,' 'is square,' 'doesn't end sharply; is ending sharply necessary? Always was in others; was not in my definition; so we will call it Deral.'"

Deral, Card 2 (January 18, 1913) "Yes." Time, 3.2 sec. Introspection: "My attention went first to the left-hand figure, and the vocal-motor image of 'some brilliant red' appeared. I looked at that red for a while, simply as red. Then my attention shifted, and as it fell upon various parts of the figure, vocal-motor images representing those parts occurred, as follows: 'lower line,' 'notch,' 'striations.' Then my affirmative reaction followed."

Deral, Card 4a (January 18, 1913) "Yes." 11.2 sec. Introspection: "First of all my attention went to the form of the figure and a vocal-motor image of 'turned aside' appeared. I then verified all of my essential features in terms of shifts of attention and corresponding vocal-motor images as follows: 'color,' 'straight edge,' 'notch,' 'striations.' Then for a time I considered as to whether the statements of my definition, that the right-hand side was uncolored and the left-hand side was colored, could be changed so as to admit of an upper side being colored and a lower side being uncolored. This consideration was vocal-motor verbal, essentially, but I can not now remember all of the imagery. Throughout it my attitude was to include rather than to exclude. The verbal images which I can remember were 'definition right-left, this upper-lower.' 'Possible to consider merely laid on side.' 'Lower is to right, so can call it Deral.'" (How did that attitude appear?) "It appeared in an effort to find reasons for including the figure, rather than for excluding it."

Deral, Card 17 (January 27, 1913) "Yes." Time, 6.8 sec. Introspection: "My attention passed over the figure, and the points upon which I fixated were characterized in vocal-motor images as follows: 'straight edge,' 'colored,' 'curve,' 'notch.' Then my attention went to the median line, and the vocal-motor imagery of 'but has a notch, point isn't sharp but is there.' I was aware of strain and tension in my brows and eyes. Finally my affirmative response followed."

Deral, Card 18 (January 27, 1913) "Yes." (Frowns strongly.) Time, 4 sec. Introspection: "My attention went immediately to the color of the left-hand body. A vocal-motor image of 'good Lord!' appeared as I observed this. My attention then went to other features, and as my fixation fell upon them verbal images occurred, as follows: 'straight edge,' 'curved,' 'notch and point,' 'detached bodies,' 'pseudopodia,' 'shape right.' My attention then returned to the color, and I was aware of a vocal-motor consideration as to whether I could include the figure in spite of its color. I can remember the following imagery: 'definition says, left colored, color may vary.' 'According to the definition it is a Deral.' 'Should like to change definition to read 'left colored but color same for a given individual.' I was aware of extreme unpleasantness. Finally my affirmative response followed." (How completely was your vocal-motor consideration of the color present?) "It was rather complete. I can not give it exactly."

Tefog, Card 1 (February 3, 1913) "Yes." Time, 12 sec. (Observer frowns markedly after 9 sec.) Introspection: "I was aware of shifting of attention to various parts of the figure, and of verbal images corresponding to the parts upon which my attention fell. The following were the verbal images; 'central body right,' 'green,' 'crow's

foot,' 'violet bodies.' With the last I was aware of hesitation; verbal imagery of 'don't know whether' appeared, and I was aware of wondering whether the presence of these violet bodies would make it necessary to exclude the figure. My attention then went to the periphery, and the following verbal images occurred (vocal-motor): 'circular,' 'cut, but small.' Then my attention went back to the violet bodies, and I was aware of more hesitation, of tension in my brows and of a straining toward the stimulus. Vocal-motor imagery of 'outer may be colored.' My affirmative reaction followed. Throughout my observation of this card, I was aware of an attitude of including the figure, if possible. My problem seemed to be, 'let's see if we can call this a Tefoq.'

Tefoq, Card 5 (February 3, 1913) "Yes." Time, 8.2 sec. Introspection: "My attention shifted to various parts of the figure, and the points upon which it fell were characterized in verbal images, as follows: 'picture frame,' 'central body right.' My attention then went to the periphery. 'Too circular,' 'cut.' My attention then shifted to the triangular patch, and a vocal-motor image of 'small body' appeared. I hesitated upon the central part in the small body and finally appeared a verbal image of 'that's right,' followed by a return of my attention to the periphery and the background. The following vocal-motor images occurred: 'uncolored,' 'color may vary,' 'no pseudopodia,—not always pseudopodia; 'too circular.' Finally, 'nothing in definition against this.' Then my affirmative response followed. I did not look for the crow's-foot."

Tefoq, Card 3 (February 8, 1913) "No." Time, 2.8 sec. Introspection: "My attention went to the outer edge, and never left it. The following vocal-motor images occurred: 'not circular,' 'general form circular,' 'pseudopodia; too confounded irregular.' Immediately my negative reaction followed. The experience was unpleasant in a mild degree."

Tefoq, Card 7 (February 19, 1913) "No." Time, 2.2 sec. Introspection: "My attention fell first upon the central body. The vocal-motor imagery of 'edges curved, should be sharp' appeared. My negative response followed, and I did not perceive the rest of the figure at all."

Tefoq, Card 10 (February 19, 1913) "Yes." Time, 8 sec. Introspection: "My attention fell upon the central projection and vocal-motor imagery of 'Gosh that's ugly!' occurred. I was aware of contraction of my brows and of unpleasantness. Then came vocal-motor imagery of 'let's do it systematically.' My attention went then in turn to all of my essential features, and as my fixation fell upon each point vocal-motor images appeared, as follows: 'sides green,' 'right shape,' 'top uncolored,' 'crow's-foot,' 'small triangle,' 'proper place.' My fixation then went to the circular body, and verbal imagery occurred as follows: 'shape right,' 'notch.' Then came verbal imagery of 'perspective awful,' 'no reason why it could not be.' Then came verbal imagery of 'got to say yes.' My affirmative response followed. I was aware of unpleasantness and frowning. My attitude throughout was that I would like to reject that figure but could not find any valid reason for doing so."

Tefoq, Card 12 (February 19, 1913) "Yes." Time, 6 sec. Introspection: "Noted successively different parts of the figure which were represented in vocal-motor imagery at the time, as follows: 'crow's foot,' 'shape,' 'green,' 'circular,' 'notch.' My affirmative response

followed. Immediately afterwards I was aware of a visual image of the figure, and I am quite sure that the small blue triangle was missing. Before the exposure terminated I did not look for it or notice it." (What was the immediate antecedent of the appearing of your visual image? "I do not know. It just came in while I was thinking about the shape of the figure, before introspecting."

Kareg, Card 4 (March 5, 1913) "No." Time, 4.6 sec. Introspection: "This was an exceedingly unpleasant experience. My fixation went first to the left-hand body; it remained there, and the rest of the figure was not perceived. I was then aware of a highly increased mental activity, in which I considered in vocal-motor verbal fashion, whether the two-sided pyramid was possible for a Kareg figure. Although there was nothing in my definition against it, I insisted that the pyramidal Kareg figures had had either five or three sides and never two sides. I can remember the following vocal-motor image: 'can not throw it out, but none like it.' On the basis of this awareness that none of the figures were like the present one, I rejected it. Throughout my observation, I had an attitude of wanting to throw out the figure, if possible. This was largely emotional."

B. THE MAIN PROCESS OF CLASSIFYING. 1. *Nature of the Process.* In every case, the observers' classifying were constituted by a peculiar and more or less persistent course or direction of consciousness, which consisted in the fact that attention passed successively to those regions of the classification-figure whose counterparts in the generalization-series had contained essential features. If the feature were definitely present (objectively) in the classification-figure, it stood out briefly and easily in the observer's attention; and the course of consciousness continued without interruption. In many instances, the conspicuous and first-established general features (when definitely present) were noted in exceedingly brief fashion, usually without a high degree of attention; the observers were then vaguely aware of the general shape of the figure. The finer and less gross features, when obviously present, usually stood out in somewhat greater clearness; this would follow, of course, from the mere fact that the observer was obliged to spend slightly more time in his examination in order to make sure of their presence.

This course of attention persisted either until the regions of all the essential features had been examined, or until an essential feature failed to stand out rapidly and clearly as the regard passed to its region, or until a striking non-essential feature attracted the attention. In either of the two latter cases, the region in question became unusually focal. If an essential feature were obviously absent, the course of the attention was usually terminated abruptly; sometimes, however, it resumed its course after the interruption.⁶ If the essential feature were neither definitely present nor definitely

⁶ Cf. Cautious classifications, p. 93.

absent, the attention was arrested for a longer or shorter time upon the region; and strains, tensions, and unpleasantness often made their appearance. After a time, the normal course of consciousness was resumed, usually in a less rapid and facile manner—*i. e.*, the observers proceeded cautiously.

In the great majority of cases, the observers' attention went first to those regions of the grosser general features which had first been established as essential. Yet the observers never reported that they searched for these regions; instead, the features themselves, if present, flashed out in consciousness at the first glance, whereupon the observation continued. With the Zalof cards, for example, the observers usually attended first to such conspicuous features as the mere triangularity, or the general outline, or the form of the central parts; and later they explored the tentacle terminations, or other finer details. When a conspicuous essential feature was present in altered form, the observers found that their regard was fastened at the outset upon its region. If an inconspicuous general feature were altered, the observers usually did not become aware of the fact until attention, in its ordinary course, reached the altered region.

Thus the main process of classifying—the observers' manner of perceiving the classification-figures—was characterized for consciousness by a passing of attention in more or less rapid succession to the regions of the essential features, *i. e.*, by a successive definitizing and focalizing in consciousness of these regions. This may be regarded as an attention-activity of questioning,—‘Does it have the general features?’; and the ready standing-out of the feature itself, or its failure to stand out, when attention passed to its region, constituted respectively the affirmative and negative answers to the question. When an essential feature neither stood out in ready fashion nor failed definitely to appear, the observers gave their answers in a hesitant fashion.

2. Component and Concomitant Processes of the Main Process of Classifying. *a. Perception of the figure:* In many cases the process of classifying operated solely upon the visual structural basis furnished by the perception of the exposed figures.⁷ *b. Additional contents:* Very frequently,

⁷ Cf. especially *A*: *affirmative*, Zalof, Cards 7 and 10, p. 62, p. 63; Kareg, Card 1, p. 65; *negative*, Zalof, Card 3, p. 62; Tefoq, Card 4, p. 64; Card 11, p. 64; Kareg, Card 8, p. 65; *hesitant*, Zalof, Card 11, p. 63. *B: affirmative*, Zalof, Card 17, pp. 68f, first part; *negative*, Zalof, Card 9, p. 66; Card 12, p. 67; *hesitant*, Tefoq, Card 11, p. 70. *C: affirmative*, Cards 8 and 5, p. 73; *negative*, Zalof, Cards 9 and 13, p. 73. *D: affirmative*, Zalof, Card 10, p. 76; Deral, Card 12, p. 78; *negative*, Zalof, Card 8, p. 77; Deral, Card 8, p. 78; *hesitant*, Zalof, Card 2, p. 76; Deral, Card 18, p. 78.

however, the classifying was not so simple as this mere play of attention upon the classification-figure itself. In such cases, the observers reported the presence of other components besides their visual perceptions of the exposed figure. These additional components were of two sorts: *a.* Imaginal or sensory contents which reinforced the observers' findings during their examinations of the stimulus-figures themselves; and *β.* Imagery of the original series.

a. The contents which reinforced the observers' findings were usually verbal, but often non-verbal kinaesthetic. When verbal, they were usually identical with verbal images which had previously occurred during the first and later examinations of the generalization-figures. These images emerged as the observer's glance fell upon the corresponding region of the figure; and they appeared spontaneously and rapidly, usually with no specific recognition or conscious reference to the original series. Apparently they referred only to the present figure, whose examination they reinforced. The verbal imagery varied, according to whether the essential feature was present or absent in the region observed. When this feature was definitely present, the verbal imagery usually consisted merely in the verbal characterization itself.⁸ Sometimes, however, the imagery included words which expressed the correctness of the feature, as it stood out (*E*, Zalof, Card 17, p. 81). Again, the verbal reinforcing imagery occurred in a slightly changed form, as if it were an answer to a question: it stated that a figure possessed a specified essential feature (*B*, Tefoq, Card 4, 'steps washed in green,' 'triangle blue,' pp. 69f). When, on the other hand, an essential feature was dissimilar or definitely absent, the verbal reinforcing imagery included words which expressed the absence or dissimilarity of the feature.⁹ Or the verbal images were not identical with previously-employed designations, but instead they consisted in words which specified the nature of an altered region in the stimulus itself.¹⁰

The non-verbal kinaesthetic reinforcing contents consisted sometimes in imagery of the eye-movements of examining the figure,¹¹ and sometimes in internal imitations of the figure (*cf.* p. 103) which were often marked by discomfort and unpleasantness.¹²

β. The imagery of the original series was usually concrete visual, but sometimes verbal. When visual, this imagery made its appearance sooner or later after the exposure of the stimulus; the observer compared it with the stimulus figure, attending alternately to corresponding regions of percept and image. Thus the main classifying-

⁸ *B*, Tefoq, Card 3, p. 69; Card 4, pp. 69f. *E*, Zalof, Card 2, p. 79; Deral, Card 5, p. 81; Tefoq, Card 12, pp. 83f.

⁹ *B*, Deral, Card 1, 'not colored,' pp. 70f. *E*, Zalof, Card 4, 'no red nucleus,' p. 79; Card 13, 'no nucleus,' p. 81; Deral, Card 3, 'no point,' p. 81.

¹⁰ *B*, Zalof, Card 6, 'has rounded corners,' p. 66; Deral, Card 1, 'black,' p. 71. *E*, Zalof, Card 4, 'four limbs,' p. 79; Card 6, 'blue,' 'long-shaped,' p. 80; Tefoq, Card 7, p. 83. *C*, Zalof, Card 6, p. 72.

¹¹ *B*, Zalof, Card 1, pp. 65f; Card 4, p. 66. *C*, Zalof, Card 11, p. 73; Deral, Cards 1 and 5, pp. 74, 75.

¹² *C*, Deral, Card 8, p. 74; Zalof, Card 2, p. 72; Card 4, p. 72; Kareg, Card 2, p. 73.

process ran its course in terms both of percept and image. The imagery was often relatively complete, sometimes presenting those members of the original series which resembled the stimulus, and sometimes presenting the extremes, in size and form, of the original (generalization) series. Again, the concrete visual imagery was fragmentary, presenting that part of the original figures which was dissimilar or absent in the stimulus.¹³

The occurrence of concrete imagery of the original groups during the observers' examinations of the classification cards may be correlated with two conditions: *a*. The number of times the observers had examined the generalization-groups, or the number of their classifications upon past occasions; and *b*. the nature of the classification-judgment,—whether facile (affirmative or negative) or hesitant. No observer ever reported the invariable presence of imagery of the original groups with any one type of judgment; and the relative number of the judgments of any one of the three varieties which actually involved such imagery varied widely with the different observers. For a more complete treatment of this subject, *cf. Individual Differences*, pp. 106 ff.

The verbal imagery of the original series sometimes accompanied the concrete visual. It invariably consisted in words characterizing an essential feature which was lacking in the stimulus.¹⁴

3. *The Initiation of the Main Process of Classifying.* The classifying-process was usually antecedent only by the hearing of the experimenter's question: 'Is this a Zalof (or Deral, etc.)?' and by the immediate appearance to consciousness of the figure for classification. No observer ever reported a definite *Aufgabe*-consciousness of accepting the task, or of setting up a goal-idea, or of self-instruction to adopt a certain procedure, or of explicit questioning—'will it have the Zalof (or Deral, etc.) essentials?' Instead, the questioning response of attention which was characteristic of the classifying-process followed immediately upon the perception that the stimulus was exposed.

Under certain conditions, however,—when the attention was arrested by a striking variable or by a markedly dissimilar essential, or when a premature tendency to respond had occurred,—the observers occasionally reported the presence of concrete or verbal imagery which was followed by a turning of attention to a new region, *i. e.*, which initiated the reinstatement of the main classifying-process. This imagery usually presented a part of the figure which had not yet been investigated. When this was the case, it was sometimes visual (*B*,

¹³ *Cf. A: affirmative*, Deral, Card 4, p. 64; *hesitant*, Deral, Card 2, p. 64; Tefoq, Card 13, p. 65. *B: negative*, Zalof, Cards 6 and 17, pp. 66, 68; *hesitant*, Zalof, Card 10, p. 67; Card 2, p. 68; Tefoq, Card 1, with attention to background, p. 69; Card 10, p. 70. *C: affirmative*, Zalof, Card 7, p. 72; *negative*, Kareg, Card 8, p. 73. *D: affirmative*, Zalof, Cards 5 and 7, pp. 75, 76; *hesitant*, Zalof, Card 9, p. 76; Deral, Card 13, p. 78. *E: affirmative*, Zalof, Card 2, p. 79; *negative*, Deral, Card 3, p. 81; *hesitant*, Zalof, Card 8, p. 80; Card 10, p. 80.

¹⁴ *B*, Zalof, Card 6, 'bifurcation', p. 66; Tefoq, Card 5, 'hi' (hieroglyphic), p. 69. *E*, Zalof, Card 4, 'three limbs', p. 79.

Deral, Card 2, noting of right periphery, p. 71); more often, however, it was verbal,—either consisting of words which designated the essential feature subsequently investigated (*B*, Tefoq, Card 6, 'green wash,' p. 70), or taking the form of definite self-instruction to note the feature (*E*, Zalof, Card 6, 'see nucleus,' p. 80; Card 14, 'look at rest,' p. 80). When the imagery did not present a feature which was subsequently investigated it consisted in verbal self-instruction (*E*, Tefoq, Card 10, 'let's do it systematically,' p. 83) or in other kinaesthesia (*C*, Deral, Card 2, shock, p. 75). In the great majority of cases, however, no imaginal antecedents whatsoever marked the reinstallation of the classifying-process.¹⁵ Here the series of examinings of the regions of essential features merely reasserted itself after a more or less prolonged period of interruption. In the light of these instances, it seems highly probable that when the re-initiation of the classifying-process was immediately preceded by concrete visual imagery this latter is to be interpreted as constituting the initial term of the process as reinstated, rather than as an *Aufgabe*-consciousness, an awareness of intending to continue the investigation. That is, the process re-commenced in concrete imaginal terms, instead of in perceptual terms.

It occasionally happened that an observer verbalized a classification-judgment before his survey of the figure was complete. Under these conditions he usually became aware, immediately afterwards, of the inadequacy of his observation, in terms of vague imagery of that part of the figure which had not been investigated; and a renewal of the process of classifying was initiated. When such images occurred before the figure was completely removed from view, they were followed by a rapid passing of the regard to that part of the figure which had previously escaped notice. If, however, the figure could no longer be seen, the imagery was followed by an effort to make a careful examination of the neglected region, in a visual image of the stimulus,—an effort which was not always successful.¹⁶ At other times the imagery in question was accompanied by strain and affective content; and the whole functioned as a regret that the response had been given so soon (*C*, Zalof, Card 7, p. 73). Again, the imagery functioned—with or without the additional kinaesthetic and affective contents—as a desire to see the figure again, or merely as an awareness that certain parts of the figure had not been seen (*E*, Tefoq, Card 5, p. 83. *D*, Deral Card 12, p. 78). Even in such cases, however, it usually happened that the main process of classifying was rehabilitated spontaneously—operating in verbal or visual imaginal terms—with no antecedent contents whatever.¹⁶ Here, too, then, it seems most probable that the antecedent imagery, where it occurred, is to be regarded as an initial term of the reinstated process of classifying, rather than as an *Aufgabe* or intention. Thus the only instances in which unequivocal contents of intending to investigate certain parts of the figure were present were the few cases, cited above, where observers reported verbal images of self-instruction, or contents which did not present parts later investigated. The continuous sequence of experiences which constituted the process of classifying followed immediately upon the awareness that the exposure had been

¹⁵ *C*, Zalof, Card 7, p. 72; Deral, Card 12, p. 75. *A*, Zalof, Card 10, p. 63.

¹⁶ *A*, Deral, Card 4, p. 64; *B*, Zalof, Card 1, p. 65; Card 10, p. 67; Card 12, p. 67; Card 17, p. 68; Tefoq, Card 4, p. 69. *C*, Deral, Card 2, p. 74. *D*, Deral, Card 11, p. 78.

made, after the hearing of the verbal instructions; it was never instigated by the occurrence of self-instruction of any sort, and only upon rare occasions did such instruction mediate its reinstatement after an interruption.

C. THE FINER COMPONENTS OF THE PROCESS OF CLASSIFYING: THE BEHAVIOR IN CONSCIOUSNESS OF THE FEATURES OF THE CLASSIFICATION-FIGURES. Thus far we have examined the process of classifying in its larger aspects,—its general nature, its structural aspects, its manner of initiation. We shall now consider its finer component processes. These latter consist in the behavior in consciousness of the specific regions over which or to which attention passed in its main course over the figure.

1. *Behavior in Consciousness of Obviously Present Essential Features: Facile Affirmation.* a. *Normal:* As has been pointed out, when asked to state whether a figure was a Zalof (or Deral, etc.), the observers adopted a mode of observation which in itself constituted a behavior of questioning 'does it possess the essential features?'; *i. e.*, the attention passed in more or less rapid succession to those regions of the figure which had been found to contain essentials. If a feature which the observer had found to be common was definitely present in the exposed figure, it flashed out into clear consciousness as the attention passed to and over its region; and this facile and often very brief standing-out of the feature constituted in itself the affirmative answer to the question which was constituted by the peculiar course of attention. Such a standing-out of an essential feature was sometimes accompanied by additional imagery (*cf.* pp. 86 ff.), and it was frequently followed by an affirmation of some sort (*cf.* p. 91). If the observation had not as yet been completed, the attention shifted easily and readily to other parts of the figure, without any delay upon the region in question; and if the observer did not note the absence of any essential feature, an affirmative response followed. The latter was sometimes verbalized before the course of attention reached its culmination.¹⁷ (*Cf.* Premature Facile Affirmations, pp. 90 ff.).

¹⁷ Cf. the following classifications: *With no structural content other than the percept itself*, A, Zalof, Cards 5, 7, and 10, pp. 62, 63; Kareg, Cards 1 and 5, p. 65; Deral, Card 5, p. 64. B, Zalof, Card 17, p. 68. C, Zalof, Cards 8 and 5, p. 73. D, Zalof, Card 10, p. 76; Deral, Card 12, p. 78. *With imagery of the original series (concrete visual)*, A, Deral, Card 4, p. 64. C, Zalof, Card 7, p. 72. D, Zalof, Card 7, p. 76. E, Zalof, Card 2, p. 79.

When verbal imagery which reinforced or supplemented the observers' findings was present (*cf.* pp. 86 ff.) it took the form of

b. Premature Facile Affirmations: The reader will have noticed that observers frequently responded prematurely, before the attention had passed to the regions of all the essentials. In such cases, the affirmation which was aroused by the standing-out of the first essential or the first few essentials was followed by an affirmative spoken response before the course of the process of classifying was completed, or in other words, the affirmative reaction-tendency here overcame the main classifying-process. Affirmative classifyings of this sort are doubtless to be regarded as exaggerated forms of the classifying in which a tendency to say 'yes' occurred before the close of the observation but was not actually followed by a spoken 'yes.' When the 'yes' was spoken in this premature fashion, however, the main process of classifying immediately reasserted itself, and it operated upon a basis of imagery of the stimulus, if the exposure had already terminated. That is, the attention passed to those parts of the image whose fellows in the percept had not been investigated. The observers were sometimes able to complete their classifying in a glance at the disappearing stimulus, or else their imagery was definite with respect to the features which had not yet been investigated; when this was the case, they then proceeded to correct or to modify their premature response, or to indicate in some way that they were aware of the nature of the uninvestigated feature.¹⁸ Sometimes, however, the observer's imagery was indefinite with respect to the uninvestigated parts; and he merely indicated in some way his awareness that his observation of the stimulus had been incomplete.¹⁹

naming the feature which stood out at the moment; and the naming was sometimes accompanied by words which expressed the correctness of the feature: *E*, Zalof, Card 17, p. 81. Cf. also the following affirmative classifications, in which the behavior in consciousness of the essential features was complicated by the presence of supplementary imagery: *Verbal*, *B*, Tefoq, Cards 3 and 4, pp. 69 ff. *E*, Zalof, Card 2, p. 79; Tefoq, Card 12, p. 83. *Kinaesthetic of eye-movement*, *B*, Zalof, Card 1, p. 66. *C*, Zalof, Card 11, p. 73; Deral, Cards 1 and 5, pp. 74, top; 75. *Kinaesthetic of internal imitation*, *C*, Deral, Card 8, p. 74; Zalof, Card 2, p. 72.

¹⁸ *A*, Zalof, Card 5, p. 62; Deral, Card 4, p. 64; Kareg, Card 5, p. 65. *B*, Zalof, Card 1, p. 66; Card 17, pp. 68f; Tefoq, Card 4, p. 70. *C*, Deral, Card 2, p. 75; Card 8, p. 74; Card 12, p. 75. *D*, Zalof, Card 5, pp. 75f; Deral, Card 11, p. 78. *E*, Tefoq, Card 12, p. 84.

¹⁹ *A*, Zalof, Card 10, p. 63. *C*, Zalof, Card 7, p. 72. Sometimes the observer mentioned that his observation had not been complete, without describing his awareness of this fact; it seems highly probable, however, that this awareness was not essentially different from that present and described on other occasions. Cf. *D*, Deral, Card 12, p. 78. *E*, Tefoq, Card 5, p. 83.

c. *Cautious Affirmations*: In many cases the observers reported that they had proceeded more cautiously, that the course of their attention was slower, and that the features stood out more clearly as they were successively noted. The more detailed and obscure features were here noted in a still more painstaking fashion. In the Zalof figures, for example, the observer examined the arrangement of the tentacle-ends of each of the three projections, instead of being satisfied with a single glance at one of them. As regards the conscious nature of the affirmative response itself, and the extent to which and the manner in which the behavior of the feature in consciousness was accompanied by other contents, the cautious affirmative reactions were similar to the other affirmative reactions. Indeed, the two sorts of classifications were often very difficult to distinguish; it was almost impossible at times to draw a line between the slower 'facile affirmations' and the more rapid 'cautious affirmations.' We have undertaken to make the distinction chiefly because it was found to constitute a useful basis for pointing out certain differences in observation-type among our observers (*cf.* pp. 105f, 108f, ff.).²⁰

2. *The Affirmative Response*: The standing-out of the essential characteristics, constituting as it did the affirmative answer to the question present as the peculiar behavior of attention during the observation of the classification-figures, was in the great majority of instances followed only by a turning-away from the stimulus and a verbalizing of an affirmation; rarely, the latter was preceded by imagery of 'yes.'²¹ The affirmative response was sometimes imaged in verbal terms after only one or more essential features had stood out, before the course of the observation was complete; it was inhibited by the continuation of the course of attention.²² On rare occa-

²⁰ The following introspections illustrate the cautious type of facile affirmation; many of them have been referred to in previous paragraphs, but in later classifications they have been regarded as cautious: *A*, Deral, Card 5, p. 64. *B*, Deral, Card 1, as far as mention of negative tendency, pp. 70f. *D*, Zalof, Card 7, p. 76; Card 10, p. 76; Deral, Card 11, p. 78; Card 12, p. 78. *E*, Zalof, Card 2, p. 79; Card 7, pp. 79f; Card 17, p. 81; Deral, Card 5, p. 81; Card 7, p. 81; Tefoq, Card 5, p. 83.

²¹ *A*, Zalof, Card 5, p. 62; Card 7, pp. 62f; Card 10, p. 63; Deral, Card 5, p. 64; Kareg, Card 1, p. 65; Card 5, p. 65. *B*, Zalof, Card 1, pp. 65f; Card 17, pp. 68f; Tefoq, Card 3, p. 69; Card 4, p. 69; Card 7, 'yes-tendency,' p. 70. *D*, Zalof, Card 10, p. 76. *C*, Zalof, Card 2, p. 72; Card 11, p. 73; Card 5, p. 73; Card 13, 'yes-tendency,' p. 73; Kareg, Card 2, 'yes-tendency,' p. 73; Deral, Card 8, p. 74; Card 5, p. 75; Card 12, p. 75. *E*, Zalof, Card 17, p. 81; Tefoq, Card 12, pp. 83f.

²² *E*, Zalof, Card 2, p. 79; Card 7, p. 80; Card 8, p. 80; Deral, Card 5, p. 81; Card 7, p. 81; Card 9, p. 81. Cf. also 'yes-tendencies' cited in footnote 21.

sions observers reported that, as the process of classifying proceeded and as feature after feature stood out in the course of the attention, a gradual relaxing of the close concentration occurred, and the spoken 'yes' followed at the termination of the investigation (*B*, Zalof, Card 9, the 'yes-consciousness,' p. 66). Observers occasionally reported that the successive standing-out of the essential features was marked by growing pleasantness, or that pleasantness preceded the response or yes-imagery.²⁴ And kinaesthetic and organic contents, with or without pleasantness, sometimes entered into the affirmation-experience. At times these contents consisted in a kinaesthesia of tapping or waving the hand²⁵ or nodding.²⁶ Occasionally they consisted in vague organic and kinaesthetic sensations which the observers characterized in such terms as 'welling up' (*D*, Deral, Card 8, affirmative tendency, p. 78).

3. *The Behavior in Consciousness of Regions of the Figure where Essential Features had Formerly Occurred but were now Absent: Facile Negation.* a. *Normal:* When a figure of the classification-series lacked one of the essential features, or possessed it in a crucially dissimilar form, the attention was arrested at that region of the figure in which the feature should have been present. The altered region became unduly clear, and sometimes additional imaginal contents appeared. The arresting of the attention was sometimes not only described, but was also labelled by the observers as an awareness that the feature was different or 'wrong,' and sometimes it was labelled as an experience of unfamiliarity. At other times it was merely described, and not interpreted. In its present experimental setting it constituted a negative answer to the question (implicitly present as the characteristic behavior of attention) of 'does it have the essential features?' Such a halting of the attention was usually followed immediately by a negative response and by an abrupt termination of the attention-course. The observers often reacted to such an experience of 'something different,' without analyzing in detail the nature of the difference, or representing it to themselves.²⁷

²⁴ *C*, Deral, Card 1, p. 74, top. *D*, Zalof, Card 5, p. 75; Card 7, p. 76; Deral, Card 11, p. 78; Card 12, p. 78. *B*, Zalof, Card 17, p. 68; Tefoq, Card 6, p. 70.

²⁵ *B*, Zalof, Card 2, p. 66. *C*, Deral, Card 1, p. 74 (near bottom).

²⁶ *C*, Zalof, Card 8, p. 73; Card 7, p. 72; Deral, Card 1, p. 74.

²⁷ *A*, Zalof, Card 3, p. 62; Tefoq, Cards 4 and 11, pp. 64f; Kareg, Card 8, p. 65. *B*, Zalof, Cards 3, 9, 12, 17, pp. 66f, 69. *D*, Zalof, Card 8, p. 77; Deral, Card 8, p. 78. *C*, Zalof, Cards 9 and 13, p. 73.

In relatively few cases observers reported that the arrest of the attention by the altered essential feature was marked by more or less intensive kinaesthesiae and organic sensations, one observer even mentioning a peculiar feeling of being suspended in the air. (*B*, Zalof, Card 13, p. 67; Tefoq, Card 7, attention to curves, p. 70.) The imagery of the original series, when it occurred, contained the altered or absent feature in prominent or even in isolated fashion. This was occasionally verbal imagery of the name of the feature in question;²⁸ often it was concrete visual, in which the feature was either dominant or present alone, *i. e.*, the imagery was fragmentary. In the latter case, the fragment of visual imagery was sometimes projected into its proper place in the stimulus-figure.²⁹ When reinforcing imagery occurred, if verbal, it either consisted in the designation of the absent feature preceded by 'no,' or else it characterized the nature of the change.³⁰ If the reinforcing imagery were kinaesthetic, of internal imitation, it was usually accompanied by discomfort or unpleasantness, such as would be experienced if the observer normally possessed the bodily attitude of the correct figure, but was now forced to take the distorted attitude of the stimulus.³¹

b. Cautious Facile Negation: In certain of their negative classifications, the observers proceeded in a relatively painstaking fashion; if the absence or crucially altered nature of an essential feature were noted before the course of the observation was completed, the observer inhibited his imagery of 'no' or his kinaesthesia of negation and continued his exploration of the figure.³²

4. The Negative Response. The arresting of the course of the main process of classifying, constituting as it did the negative answer to the questioning course of attention—"does it have the essential features?"—was usually followed only by a turning of attention away from the stimulus with the voicing of a negative response.³³

The actual negative response, however—the process of rejecting the figure—was sometimes more complex than this mere vocalizing of the 'no.' Observers sometimes reported that their spoken "no"

²⁸ *B*, Zalof, Card 6, 'bifurcation,' p. 66; Tefoq, Card 5, 'hi—,' p. 69. *E*, Zalof, Card 4, p. 79.

²⁹ *B*, Zalof, Cards 6 and 17, pp. 66, 68. *C*, Kareg, Card 8, p. 73.

³⁰ *B*, Zalof, Card 6, p. 66; Deral, Card 1, pp. 70f. *E*, Zalof, Cards 4 and 13, pp. 79, 81; Tefoq, Card 7, p. 83. *C*, Zalof, Card 4, p. 72.

³¹ *C*, Zalof, Card 4, p. 72; Kareg, Card 2, p. 73. For kinaesthesia of eye-movement. *B*, Zalof, Card 4, p. 66.

³² *A*, Zalof, Card 5, p. 63. *B*, Zalof, Cards 9, 15, and 18, pp. 67, 68, 69; Deral, Card 1, pp. 70f. *C*, Zalof, Card 3, p. 72. *D*, Deral, Card 4, p. 77. *E*, Zalof, Cards 3 and 6, pp. 70f; Deral, Card 3, p. 81.

³³ *A*, Zalof, Card 3, p. 62; Tefoq, Cards 4 and 11, pp. 64f; Kareg, Cards 4 and 8, p. 65. *B*, Zalof, Cards 3, 12, and 17, pp. 66 ff; Tefoq, Cards 4 and 5, p. 69. *C*, Zalof, Card 9, p. 73. *D*, Zalof, Card 8, p. 77; Deral, Card 8, p. 78. *E*, Zalof, Cards 4 and 6, pp. 79f.

was preceded by verbal imagery, sometimes of 'no'³⁴ and sometimes of words which expressed the reason for rejecting the figure.³⁵ In a few instances an observer mentioned a slowly-increasing vocal kinaesthesia of 'no,' which culminated in the spoken negation (*C*, Zalof, Card 4, p. 72). Again, the observers occasionally reported more emphatic rejections of the figure which were marked by the presence of varying amounts of kinaesthetic and affective content, and which were sometimes closely bound up with attitudes of 'belligerency' or of aesthetic disapproval of the figure.³⁶

5. Behavior in Consciousness of Indefinite Essentials: Hesitant or Uncertain Classifications. Two sorts of hesitant or uncertain reactions occurred in our experiments: *a.* Those in which the observers hesitated upon a region in the stimulus-figure in which a certain essential feature was neither definitely present nor absent; and *b.* those in which the observers were uncertain as to the validity of their definition of the group, and were unable to remember whether a certain feature was or was not general. The former type of hesitant reaction was by far the more common. *a.* It occasionally happened that a feature which an observer had found to be essential was altered in a striking fashion, yet not so much so as to be definitely present or absent. When this was the case, the feature behaved in a characteristic fashion in consciousness; its mode of behavior was markedly different from the behavior of definitely present or absent essential features. All of the observers reported that when their regard passed to the altered region they attended more or less persistently to the altered parts. The region thus assumed an unusual degree of clearness. In many instances an altered non-essential feature or a striking variable one behaved in the same fashion.

The arrest of the attention and its subsequent compelling and prolonged holding by the altered essential or striking non-essential was usually followed by a reappearance of the main process of classifying, but in a modified form. The observers now finished their exploration in a highly deliberate and cautious fashion; they not infrequently interpreted this behavior as a desire to exclude the figure upon some basis other than that of the indefinite feature itself. Provided no other changed aspect claimed attention, however, the observer's regard usually returned to the indefinite region, and he

³⁴ *B*, Zalof, Card 9, pp. 66f. *C*, Zalof, Card 13, p. 73. *E*, Zalof, Card 3, p. 79.

³⁵ *B*, Zalof, Card 6, p. 66. *C*, Zalof, Card 6, p. 72. *E*, Tefoq, Card 7, p. 83.

³⁶ *B*, Zalof, Card 2, initial negative tendency, p. 68; Card 4, p. 66; Tefoq, Card 7, p. 70. *E*, Deral, Card 3, p. 81.

ultimately responded with an affirmative or a negative judgment, or in rare instances with a doubtful judgment. The response was affirmative in eighty-two per cent of our cases.

The arrest and prolonged holding of the attention by the altered region was usually marked, sooner or later in its course, by the presence of kinaesthetic and organic, or affective, contents, or all. The observers sometimes specified tensions, strains, frowning, and the like.³⁷ Sometimes the hesitation upon a feature was characterized by verbal imagery of questioning the nature of the indefinite aspect, or of fragments of the definition (*E*, Tefoq, Card 1, p. 82). Or this hesitation was occasionally marked by alternating affirmative and negative tendencies as the eye distinguished one aspect after another (*A*, Deral, Card 3, p. 63; *C*, Deral, Card 1, p. 74). In many instances imagery of the generalization-series, or imagery which supplemented the altered region in the stimulus itself, or both, occurred. The supplementary imagery was in all cases verbal. Sometimes it took the form of a more or less sketchily imaged argument, or of a silent vocalization of the aspects of the feature, as these stood out one after another;³⁸ again, it took the form of comments or judgments concerning the feature.³⁹ The imagery of the original series was visual, and the observer attended alternately to the region of the changed feature in the percept and the image.⁴⁰

b. Occasionally an uncertain or hesitant reaction was marked by an observer's dissatisfaction with his definition, or by his inability to remember whether or not a feature had proved to be essential to the group. Dissatisfaction with the definition consisted in an attending away from the stimulus to imaged fragments of the definition—vocal-kinaesthetic or auditory verbal—accompanied by kinaesthetic and affective components, or by verbal images which expressed the nature of the inadequacy.⁴¹ Inability to remember the exact nature of an essential feature, or to recall whether a feature had been found to be essential, consisted sometimes in the appearance of obscure consciousnesses of doubt and uncertainty, or of

³⁷ *A*, Deral, Card 2, p. 64; Tefoq, Card 13, attention to the central part, p. 65. *B*, Zalof, Cards 10, 2, and 5, pp. 67f; Tefoq, Card 1, attention to background, p. 69; Cards 10 and 11, pp. 70; Deral, Card 2, p. 71. *D*, Zalof, Cards 2 and 9, pp. 76f; Deral, Cards 1, 13, and 18, pp. 77, 78f; Kareg, Card 3, p. 79. *E*, Zalof, Cards 8, 10, and 14, pp. 80f; Deral, Cards 9, 4a, and 18, pp. 80f; Tefoq, Cards 1, 4, and 10, pp. 82ff.

³⁸ *B*, Zalof, Card 5, 'bifur—', p. 68; Deral, Card 2, p. 71. *D*, Deral, Card 1, attention to gray, p. 77. *E*, Deral, Cards 9, 4a, and 18, pp. 81f; Kareg, Card 4, p. 84; Tefoq, Card 10, p. 83.

³⁹ *E*, Zalof, Card 8, 'not similar', p. 80; 14, p. 80; Tefoq, Card 1, 'violet bodies', pp. 82f; 10, p. 83.

⁴⁰ *A*, Deral, Card 2, p. 64; Tefoq, Card 13, p. 65. *B*, Zalof, Cards 10 and 2, pp. 67f; Tefoq, Card 1, attention to background, p. 69; Card 10, p. 70. *D*, Zalof, Card 9, p. 76; Deral, Card 13, p. 78. *E*, Zalof, Cards 8 and 10, p. 80.

⁴¹ *C*, Zalof, Card 1, p. 71. *E*, Deral, Card 4a, p. 82, Card 18, p. 82.

(in one case) non-bodily tensions, which were dominantly affective in character; the observer at the time attended to the doubtful feature, as it appeared in the stimulus (*D*, Zalof, Card 2, p. 76; Deral, Card 17, p. 78). At other times this inability consisted in attending away from the present stimulus to remembrances of the generalization-series, with kinaesthetic contents of questioning whether the feature were essential (*D*, Deral, Card 5, p. 77).

6. *The Behavior in Consciousness of Strikingly Dissimilar Non-general Features, or Conspicuous Novel Features.* It not infrequently happened that features which had been established as non-essential to the group attracted the observers' attention to a greater or less extent. Conspicuous novelties, or strikingly altered non-essential features received all degrees of attention. They were sometimes ignored; again, they stood out with all the clearness and persistence of altered essentials and were actually followed by a spoken negative response, although of course the alteration which claimed the attention did not afford logical justification for rejecting the figure. Many stages were represented between these two extremes, *a*. The variable feature was sometimes non-focally present to attention; here the observers noted its presence as an insignificant fact; it had no influence upon the course of the observation, nor did it arouse a reaction tendency.⁴² *b*. Again, the attending to striking variables constituted a distraction from the course of observing the general features, which last was presently resumed. The variable was sometimes present in a high degree of clearness, and was even named, but had no effect upon the classification other than to delay its course.⁴³ *c*. Rarely, an observer reported that attention was withdrawn with difficulty from the compelling non-essential (*C*, Deral, Card 2, pp. 74f). *d*. Again, the standing-out of the non-general feature was followed by verbal imagery which expressed the non-essential character of the feature, or by verbal imagery of parts of the definition in which it had been stated that the group-figures proper might vary, in respect to the feature.⁴⁴ *e*. In the majority of cases, however, the standing-out of the conspicuous non-essential feature was followed

⁴² *B*, Zalof, Card 2, the bigness, p. 66; Tefoq, Card 3, the outline, p. 69. *D*, Zalof, Card 10, awareness of irregularity, p. 76; Card 2, awareness of redness, p. 76. At the time of *D*'s considerations of the 'hairs' and 'cilia' of the Deral figures he had not yet established these features as non-general in his examinations of the original series.

⁴³ *A*, Zalof, Card 11, p. 63. *C*, Zalof, Card 6, attending to 'dots,' p. 72. *E*, Deral, Card 2, 'redness,' p. 82.

⁴⁴ *E*, Zalof, Card 17, redness, p. 81; Deral, Card 7, size, p. 81.

by a more or less strong negative response which nevertheless did not actually overcome the course of the observation and thus lead to a spoken rejection. Any or all of the structural components which characterized the negative tendency or hesitant judgment (*Cf.* pp. 93 ff.) were sometimes present, and the whole experience was frequently followed by an unusually deliberate and thoroughgoing examination of the other regions of the figure, or by a strengthening of a negative response already present. Apparently more than the usual confirmation was necessary here in order to set free the affirmative response.⁴⁵ It frequently happened that imagery of a visual or verbal sort appeared, in terms of which the observers became aware of the possible variable character of the feature under observation. These two modalities of imagery obviously functioned in a strikingly similar fashion.⁴⁶ *f.* And the highest degree of attention to variable features is exemplified in those cases where the standing-out of the non-essential feature was followed by an actual negative response (*A*, Tefoq, Card 11, p. 64).

7. *The Experiences of Familiarity and of Unfamiliarity.* Some of the observers occasionally reported that they were aware that a feature was new or unfamiliar or that it was familiar. They sometimes spoke of a 'feeling of familiarity,' or merely of 'familiarity.' They were usually able to analyze these consciousnesses; and they found them to consist essentially in a peculiar form of behavior of the novel or the familiar feature in consciousness. The experience of unfamiliarity or of newness invariably consisted in the fact that the course of attention was arrested, or blocked, by a feature which was dissimilar to the form that it had been observed to possess in the original series; and the feature thus attained a relatively higher and more prolonged clearness.⁴⁷ Sometimes kinesthetic components—respiratory, or manual, of pointing,—and affective components appeared in addition to the characteristic behavior of the features in consciousness.⁴⁸ The experience of familiarity proved, for *A* at least, to be more difficult of analysis. With *C*, this experience consisted essentially in the rapidity and readiness with which a feature stood out in her perception (Deral, Card 5, p. 75); sometimes marked kinesthetic contents (respiratory changes and internal imitations) and pleasantness were present in addition (Deral, Card 1, p. 74, near bottom).⁴⁹

⁴⁵ *B*, Tefoq, Card 6, bigness of outline and smallness of stairs, p. 70; Zalof, Card 5, p. 68; Deral, Card 2, redness, p. 71. *A*, Zalof, Card 5, p. 63; Deral, Card 2, p. 64; Tefoq, Card 1, p. 64.

⁴⁶ *B*, Tefoq, Card 1, p. 69; Card 10, p. 70. *E*, Tefoq, Card 1, p. 83; Card 5, p. 83; Card 10, p. 83.

⁴⁷ *A*, Kareg, Cards 1 and 4, p. 65.

⁴⁸ *C*, Zalof, Card 6, 'dots,' p. 72. *B*, Zalof, Card 2, 'strange new feeling,' p. 68.

⁴⁹ There seems little reason for doubting that in *A*'s case also the experience of familiarity consisted in the fact that the familiar feature stood out readily and rapidly, and did not interfere with the course

Hence it appears that the experiences of familiarity and of unfamiliarity consisted essentially in peculiar modes of behavior of certain features in consciousness, with or without additional kinaesthetic and affective components. In all cases in which the labels of 'familiarity' or 'novelty' were applied by the observers to such experiences, moreover, our introspections indicate the presence of contents and factors in virtue of which the experience was striking and focal, a condition which evidently favored its reflective interpretation or labelling. These contents included intensive kinaesthesia⁵⁰ and prolonged duration of the blocking of attention.⁵¹ Moreover, the presence immediately before the experience of one of the opposite sort favored its being labelled.⁵²

Nevertheless, many experiences whose conditions were similar to those just described were not interpreted as familiarity or unfamiliarity, but were instead merely described, or described and labeled as acceptance or rejection of the figure, as awareness that something was wrong, as belligerence or hostility toward the figure, etc.⁵³ In other words, the remarkable fact appears that exactly the same sort of experiences were sometimes labeled as familiarity or unfamiliarity, as acceptance or rejection, as a yes-tendency, as an awareness that something was wrong, or indeed were not labeled at all.

Our experimental data are not sufficiently numerous to indicate in any complete fashion the conditions under which these several labels were employed by the observers. But a reference to the experimental situation throws much light upon the matter. The observers were in an 'Is-it-a-Zalof?' situation; the attention-coursing which composed the process of classifying constituted in itself the question, 'Does it have the essentials?'; and the experiences of ease and readiness of observation, or of arrest of attention, normally shifted without more ado into a 'yes-ness' or 'no-ness,' *i. e.*, they *meant* an acceptance or rejection of the figure. Consequently the observers would ordinarily merely describe the experience, without labeling it, or if for any reason they did reflect upon it or label it in retrospect, the

of attention. In the few classifications in which he reported that a feature seemed familiar, his noting of this feature was characterized by ease of observation and by non-interference with the course of attention. The experience of familiarity was usually much less eventful and striking than that of unfamiliarity, a fact which readily explains the greater difficulty which *A* experienced in analyzing it. *A* was more successful in analyzing his familiarity during his examinations of the figures of the group proper; and his analysis here supports our present contention: *Cf. op. cit.* p. 57, foot-notes 57, p. 94, and 63, p. 96.

⁵⁰ *B*, Zalof, Card 2, p. 68. *C*, Zalof, Card 6, p. 72; Deral, Card 1, p. 74, near bottom.

⁵¹ *A*, Kareg, Cards 1 and 4, p. 65.

⁵² *A*, Deral, Card 2, familiarity which occurred after the blocking of attention by the redness, p. 64. *C*, Deral, Card 1, recognition after the initial negative tendency, p. 74, near bottom; Card 5, *cf.* doubt in connection with the previous figure, p. 75. In one introspection, at least, there is evidence that the same holds for the experience of certainty: *Cf. B*, Zalof, Card 10, p. 67. This certainty followed upon a previous doubt.

⁵³ *A*, Tefoq, Card 13, p. 65. *B*, Zalof, Card 4, p. 66; Tefoq, Cards 1, 6, 7, and 11, pp. 69f. *C*, Zalof, Card 13, p. 73; Kareg, Card 2, p. 73.

label favored would be that of acceptance or rejection of the figure, or of a feeling that it did or did not belong to the group. The observers were not in a recognizing situation,—the problem was not 'have you seen this figure?'—and hence the label of 'familiarity' or 'novelty' was here more remote. Consequently it is not surprising that the observers relatively seldom mentioned familiarity or awareness of novelty. The situation, then, was undoubtedly the most important factor in the interpretation or labelling of the experiences of fluency, or of difficulty and arrest of attention. Nevertheless the fact that the observers sometimes employed labels that were less directly in accord with the favored one indicates that other factors co-operated. These probably included such factors as the striking character of the components, and individual interpretation-tendencies.

D. THE RELATION BETWEEN THE MAIN PROCESS AND THE AFFIRMATIVE OR NEGATIVE RESPONSE. The preceding sections have indicated that two distinct sorts of process were operative in our classification-experiments. One of these was the characteristic course of the classifying as a whole, *i. e.*, the well-marked and unmistakable passing of attention and regard in successive fashion to the regions of figures which had been found to contain essential features. The other process was the characteristic response to the behavior in consciousness of any one feature—the affirmative response to the rapid and easy flashing out of the feature, the negative response to the sharp halting and prolonged arresting of attention upon the feature. The former was more dynamic, more forward-pushing. The latter tended toward the static; it constituted in a sense a response of consciousness to the events which composed the former. When the response was not prevented from realizing itself by the immediate continuation of the process it became richer in imaginal or kinaesthetic content, and it merged into the complex 'attitudes' which were frequently labelled as acceptance or rejection of the figure, or even as familiarity or unfamiliarity, novelty.

Our experiments indicate that a peculiar balance, or interplay, existed between these two processes or directions of consciousness. Under the conditions of our experiments, the uninterrupted and easy continuance of the process at any point in its course was endowed with a strong affirmative response-tendency; at the outset, however, this fused with the main process, and retarded the latter only slightly, if at all, *i. e.*, the continuum of the examination of the figure was straightforward, practically no approximations toward the response-state occurring. Soon, however, the response began to realize itself in more energetic fashion, and at times actually consisted in a spoken judgment, with momentary banishing of the process of classifying. (*Cf.* premature affirmations.)

Nevertheless, the classifying-process, when thus interrupted, always became reinstated upon a later occasion.

The negative response which attached to the blocking or arrest of attention upon any feature, when not immediately verbalized, usually constituted the condition of a marked retarding and prolonging of the process of classifying, when the latter became reinstated. The negative response was not confined to those arrests of attention which occurred in the normal course of the classifying-process; it also attached to arrests which were occasioned by striking variables. In other words, the negative significance which theoretically should have attached only to arrests of the classifying-process, *i. e.*, to altered essential features, also attached in some degree to striking non-essential features as well. Moreover the negative response-tendency even under these conditions was followed by a slowing of the classifying-process, when the latter became reinstated. But the negative response-tendency, when it occurred under these conditions, seldom became verbalized; its occurrence outside of the normal attention-route apparently meant a diminution of its energy, or capacity for full realization. Thus the main classifying-process and the negative response, while to some extent independent, nevertheless possessed neural bases which exerted a profound influence upon one another.

E. INDIVIDUAL DIFFERENCES. 1. *Structural*. The structural differences among our observers had to do with the nature of the imaginal and sensory and affective components which supplemented the observers' classifications of the stimulus-figures. These components embraced five types: *a*. Imagery which presented the figures of the group proper ('group-imagery'); *b*. Contents which reinforced the observers' perceptual findings; *c*. Contents which entered into experiences of doubt or of hesitation; *d*. Personal reactions to the figures; and *e*. Contents which accompanied experiences of affirmation or of negation.

a. Group-imagery: The imagery which presented the figures of the group proper was concrete and verbal. The observers differed both as to the relative dominance of the two sorts of imagery, and as to the nature of the concrete imagery itself.

A is the only observer whose group-imagery was exclusively of one type; in his case, such imagery was concrete visual in every instance. Usually it consisted of several images of members of the original series;⁵⁴ sometimes it consisted in a single such image (Zalof, Card 7, p. 62). And rarely, his group-imagery consisted of a single schematic visual image (Tefoq, Card 13, p. 65). When *A*'s group-imagery consisted of a single particular visual image, this presented

⁵⁴ *A*, Deral, Cards 2 and 4, p. 64; Tefoq, Card 1, p. 64.

a member which resembled the stimulus-figure—sometimes one which possessed certain variable features which were similar to the variables in the present figure.

B, *D*, and *E* reported that their imagery of the original group was visual or verbal, or both. *B*'s visual images were probably the most clear and distinct of those of any of our observers. They were sometimes definite and complete and particular, of certain members of the series;⁵⁵ at other times they were semi-particular.⁵⁶ These definite and complete particular or semi-particular images were usually similar to the stimulus in form and size and in the possession of certain individual variations; and it often happened that *B*'s hesitation over a feature was terminated by the appearance of an image of a member of the series which contained a similar feature. Sometimes, on the other hand, *B*'s visual group-images were fragmentary, of parts of figures. When she became aware that an essential feature was missing, she often projected a visual image of this feature into its proper place in the stimulus-card. The fragmentary visual images were particular in nature.⁵⁷ *B*'s verbal series-presentations occurred for the most part when she noted the absence of an essential feature, or a change in such a feature; and they were usually preceded by imagery of 'no.' The verbal images were for the most part auditory,⁵⁸ but sometimes they were also vocal-kinesthetic, when they were frequently vague and fragmentary (Tefoq, Card 5, p. 69). Moreover, the verbal images often possessed definite inflections—questioning (Zalof, Card 17, p. 68) and the like. *B*'s verbal group-imagery functioned upon rare occasions as an intention to note certain features (Tefoq, Card 6, 'green wash,' p. 70).

D's imagery of the original group, when visual, represented varying degrees of clearness and completeness and distinctness; but it was definite in the possession of the features which he had discovered to be essential to the group, and particularly of the features to which he was at the time attending. In all but one instance *D*'s visual imagery presented particular figures—a single one, or a number of them; and the images either presented members of the original series whose form most closely approximated that of the stimulus (Zalof, Card 3, Card 5, p. 75) or else they included the extremes, in form and size, of the group (Zalof, Card 7, p. 76). *D*'s verbal imagery included words which characterized the essential features of the group, and which he had used, during his examinations of the members, to characterize features whose generality he was investigating (Deral, Card 1, p. 77). In some cases *D* reported verbal imagery which took the form of a question regarding the nature of the original group (Deral, Card 5, p. 77). Occasionally such a verbal image functioned as an intention to investigate a certain part of the figure.

E's concrete visual group-imagery was sometimes particular or semi-particular—of definite members of the group. When this was the case, the imaged figure was almost always one which approximated the stimulus in size and form (Zalof, Cards 3, 7, 10, pp. 79f.). Again *E*'s visual images were fragmentary, of parts of

⁵⁵ Zalof, Card 10, p. 67; Card 2, p. 68; Tefoq, Card 1, p. 69; Deral, Card 1, p. 70.

⁵⁶ Zalof, Card 15, p. 68; Tefoq, Card 5, p. 69; Card 10, p. 70.

⁵⁷ Zalof, Card 18, p. 60; Card 13, p. 67; Tefoq, Card 5, p. 69.

⁵⁸ Zalof, Card 6, 'bifurcation,' p. 66; Card 15, 'bifurcations,' p. 68; Card 17, auditory imagery of definition, p. 69; Tefoq, Card 10, p. 70.

the original figures which corresponded to the regions now being investigated in the stimulus (Zalof, Card 2, p. 79; Card 8, p. 80). His visual imagery was inclined to be vague and rather indistinct in all but the grossest features. *E*'s verbal imagery was usually vocal-kinaesthetic, but sometimes auditory as well; and it was remarkable for its completeness and distinctness and frequency. It is difficult to distinguish his verbal group-imagery from his verbal imagery of supplementation of his findings. In some instances, however, the former appeared before he had noted whether the designated feature was present in the stimulus; and it then functioned as self-instruction to look for that feature (Zalof, Card 6, 'see nucleus,' p. 80). Again, they consisted in parts of the definition, usually expressing the variable character of a feature being observed in the stimulus (Zalof, Card 17, 'not red—doesn't need to be,' p. 81. Deral, Cards 4a and 18, p. 82).

C's presentations of the original group-members included the widest range of image-modalities which was exhibited by any of our observers. Her group imagery was concrete visual and kinaesthetic of internal imitation, as well as verbal. *C*'s concrete visual images varied in distinctness and completeness; they usually presented whole figures, and were sometimes particular or semi-particular,⁵⁹ and sometimes fragmentary (Zalof, Card 7, p. 73). At times *C*'s kinaesthetic and organic contents of internal imitation consisted in strains and tensions and organic sensations of being posed in an attitude similar to the main form of the group members; they consisted in revivals of similar contents which had been present during the observer's examination of these figures.⁶⁰ Her verbal imagery was visual (Zalof, Card 4, p. 72) or vocal-kinaesthetic.⁶¹ It included parts of her definition, or words which referred to various features of the original group; or sometimes the words accompanied a visual image and expressed its generality, or typicality of the series (Kareg, Card 8, pp. 73f).

b. Contents which reinforced the observers' perceptual findings: All of the observers excepting *A* occasionally reported the presence of imagery which reinforced their findings in the stimulus which was being observed; and they differed both in the amount and in the nature of this imagery.

D's and *E*'s imagery of their findings was exclusively verbal. In *E*'s case this imagery included for the most part images of words which had been used during the examination of the group to designate features which were being investigated, and it now appeared as a confirmation of the presence of these same features in the classification-stimulus (Zalof, Card 2, p. 79, etc.). Very frequently, however, the words referred to variations which were peculiar to the present figure (Zalof, Card 4, p. 79; Deral, Card 3, p. 81, etc.). Again, *E*'s verbal images referred to the similarity or dissimilarity of the stimulus to the original figures (Zalof, Card 8, p. 80). *D*'s verbal imagery designated for the most part certain peculiarities of the perceived stimulus (Zalof, Card 5, p. 76).

B's reinforcing imagery was rather infrequent; it was usually verbal, auditory or vocal-motor (Zalof, Card 12, p. 67; Deral, Card 2, p. 71; etc.) and sometimes kinaesthetic, of eye-movement (Zalof, Card 1, p. 66). *C*'s imagery of her findings in the classification-

⁵⁹ Zalof, Card 7, p. 72; Deral, Card 1, p. 74 (near bottom); Kareg, Card 8, p. 73.

⁶⁰ Zalof, Card 1, p. 71; Card 2, p. 72; Card 4, p. 72.

⁶¹ Zalof, Card 1, p. 71; Card 4, p. 72; Deral, Card 1, p. 74.

figures was widely varied in nature,—more so than that of any other observer. It was vocal-kinaesthetic or visual verbal, the words either representing features which were peculiar to the stimulus (Zalof, Cards 3, 6, p. 72) or else designating the resemblance or lack of resemblance of the stimulus to the group (Kareg, Card 2, p. 73). Occasionally *C*'s supplementary stimulus imagery (or sensory content) was kinaesthetic, of eye-movements (Zalof, Card 3, p. 72; Deral, Card 2, p. 75). But far most striking and characteristic were her kinaesthetic and organic contents of internal imitation of the stimulus; she felt herself as posed—extended or constricted—in an attitude which resembled the main lines and directions of the stimulus figure; and if these differed from those of the group figures, she usually reported an empathic element of the discomfort—lack of balance, or strain, or dizziness—which would ensue from being in a position similar to that of the stimulus. In other words, the imitated position of the original figures was apparently a relatively comfortable one, *i. e.*, no unpleasant strain or discomfort was reported. But the distorted positions of some of the classification-figures occasioned the same discomfort, with her imitation of them, which she might feel if forced to maintain such a distorted position; and this discomfort, or feeling of lack of balance, was endowed in the experimental situation with a strong negative significance. Cf. Zalof, Card 4, p. 72; Kareg, Card 2, p. 73; Deral, Card 1, p. 74 (near bottom); Card 2, p. 75.

c. Contents which entered into experience of doubt or of hesitation: The observers reported in varying degree the presence of experiences of doubt, or of hesitating on a feature.

These experiences were exceedingly rare in the case of *C*, who was one of the most rapid classifiers, and who reported fewest cautious classifications (*cf.* p. 109); and with both *C* and *A*, experiences of doubt and hesitation were nothing more than the behavior in consciousness of the doubtful feature,—the manner in which it was present, and (with *A*) the cautious investigation which followed, and the tendency for the attention to return to the doubtful region. *B* reported more or less intensive kinaestheses in addition,—catchings of the breath (Zalof, Card 1, p. 66) and unpleasantness, with tensions about the chest, eyes, forehead, etc. (Tefog, Card 11, p. 70). In the cases of *D* and *E*, the components which emerged in experiences of doubt or hesitation were kinaesthetic and organic and affective, or all three. *D* frequently reported *Bewusstseinsslagen* of doubt and hesitation, which were essentially organic and kinaesthetic and unpleasant—largely the latter—and which were very difficult to localize (Zalof, Card 2, p. 76). Once he reported a 'non-bodily tension' which he was unable to describe more fully (Deral, Card 17, p. 78), and once he reported a 'mental paralysis'—a very intensive tension (Deral, Card 18, p. 79). *D*'s hesitation was sometimes dominantly verbal in content—vocal-kinaesthetic contents of questioning whether a certain feature was present. *E* usually reported that his doubt regarding a feature was characterized by kinaesthesia of close observation—strain about the eyes and brows—and by verbal imagery which expressed the nature of his difficulty: Cf. Deral, Card 9, p. 81; Card 44, p. 82; Card 17, p. 82; Card 18, p. 82; Tefog, Card 1, p. 83; Card 10, p. 83; Kareg, Card 4, p. 84.

d. Personal reactions to the figures: *B* and *E* occasionally reported certain experiences which may perhaps be called personal reactions toward a figure. In *E*'s case, these reactions were aesthetic; they consisted in the fact that a figure was pleasing or disagreeable to

him, or that it appeared ugly. The reactions were either entirely affective, or affective and kinaesthetic—strains in forehead, face, or chest—and verbal images—'ugly,' and the like: *Cf.* Zalof, Card 10, p. 80; Deral, Card 3, p. 81; Tefog, Card 10, p. 83. In *B*'s case the personal reactions were closely bound up with her negative attention-behavior, and she sometimes characterized them as 'hostility' or 'belligerency' toward the stimulus-figure. These states were kinaesthetic and organic and usually affective; most frequently they were bound up with the reaction-word itself, and contributed to it a peculiar explosiveness of pronunciation, or emphatic intonation. *Cf.* Zalof, Card 4, p. 66; Card 9, p. 67; Card 13, p. 67; Card 15, disgust with bifurcations, p. 68. *B*'s personal reactions toward the figures appeared only in the Zalof classifications, which came first. This fact indicates the presence of a mechanizing process, by which the reactions became more and more confined to the fundamental play of attention.

e. Contents which accompanied the experiences of affirmation or negation. All of the observers reported more or less frequently that images of 'no' or of 'yes' accompanied their affirmative or negative attention-processes, or followed immediately upon them. All of the observers excepting *A*, however, reported at times the presence of additional contents, which latter differed with different individuals. *E* occasionally reported that the negative attention-response was followed by images of words which expressed the impossibility of the questionable feature being present in the original group, or which designated the respects in which the feature was dissimilar (Tefog, Card 3, Card 7, p. 83). *C*, *B*, and *D* frequently reported organic and affective components, and *C* reported on rare occasions the presence of verbal images which expressed the reason for her rejecting the figure. Her affirmative contents usually consisted in kinaesthesia of nodding (Zalof, Cards 7 and 8, pp. 72f) and sometimes in a wave of the hand as well (Deral, Card 1, p. 74, near bottom). The additional components in her experiences of negation appeared as vocal-motor kinaestheses which preceded the spoken 'no' (Zalof, Card 4, p. 72) or as kinaestheses of squinting or wrinkling the forehead (Zalof, Card 1, pp. 71f). *B* frequently reported that her affirmation-experience was complicated by kinaesthesia of relaxing (Zalof, Card 2, p. 68) or by pleasantness (Zalof, Card 17, p. 68). Her experience of negation was sometimes marked merely by kinaesthesia of turning away from the stimulus (Zalof, Card 9, p. 67) and sometimes by kinaesthesia of shallower breathing and intensive fixating upon the feature (Zalof, Card 2, p. 68), or of bodily rigidity (Tefog, Card 6, p. 70). *D* frequently reported that pleasantness accompanied his experience of affirmation: Zalof, Card 5, p. 75; Card 7, p. 76; Deral, Cards 11 and 12, p. 78. In one instance he reported an organic 'welling-up' with a kinaesthesia of extending his hand (Deral, Card 8, p. 78); again, he mentioned a 'willingness to accept' a feature, which willingness was composed in part at least of affective toning. His experiences of rejection were sometimes complicated by the presence of emotional components (Deral, Card 1, p. 77) or by slight shock (Deral, Card 4, p. 77).

2. *Functional*: The functional differences among our observers had to do with *a.* the extent to which the process of classifying was supplemented by imagery of the original series; *b.* the conditions under which such imagery appeared;

c. the extent to which the classifying-process was diverted from its course by striking irrelevancies; and *d.* the relative dominance of the main process of classifying, on the one hand, and of the affirmative or negative reaction-tendencies, on the other hand.

a. The extent to which the process of classifying was supplemented by imagery of the original series: Table II indicates the extent to which imagery of the original series occurred in the classifying of every observer (*cf.* the two

TABLE II

The total number of classifications of every type for each observer with the per cent of cases in which imagery of the original series occurred in each type of classification. The main column-headings represent the types of classifications: facile affirmative and facile negative, cautious affirmative and cautious negative, and hesitant. Of the two columns under each main caption, the left contains the total number of classifications of that type, and the right contains the per cent of that number in which imagery of the original series appeared.

Obs.	Facile				Cautious				Hesitant				Total	
	affirmative		negative		affirmative		negative		affirmative		negative		No.	Im.
	No.	Im.	No.	Im.	No.	Im.	No.	Im.	No.	Im.	No.	Im.	%	%
<i>A</i>	8	00	4	00	1	00	2	00	2	50	17	6		
<i>B</i>	8	12	8	50	1	00	5	80	6	33	28	29		
<i>C</i>	6	16	7	28	0	00	1	00	1	100	15	27		
<i>D</i>	3	66	3	33	3	00	5	40	3	33	17	35		
<i>E</i>	2	100	6	16	3	66	4	50	9	33	24	41		
Total	27	22	28	28	8	25	17	47	21	38	101	32		
<i>A</i>	3	66	1	00	1	00	2	00	3	100	10	50		
<i>B</i>	0	00	0	00	0	00	1	100	1	100	2	100		
<i>C</i>	4	25	3	33	0	00	0	00	3	33	10	30		
<i>D</i>	0	00	5	00	3	00	2	00	8	12	18	5		
<i>E</i>	7	00	8	12	2	00	0	00	6	00	23	4		
Total	14	21	17	11	6	00	5	20	21	28	63	16		
<i>A</i>	3	00	4	00	4	00	1	00	3	100	15	20		
<i>B</i>	3	33	5	40	0	00	1	100	4	50	13	46		
<i>C</i>	5	20	4	00	1	100	0	00	3	33	13	23		
Total	11	20	13	15	5	20	2	50	10	60	41	29		
<i>A</i>	6	40	3	33	0	00	0	00	0	00	9	33		
<i>C</i>	1	00	0	00	0	00	2	50	0	00	3	33		
<i>D</i>	0	00	2	00	2	00	1	00	2	00	7	00		
<i>E</i>	4	00	2	00	0	00	0	00	2	50	8	12		
Total	11	20	7	14	2	00	3	33	4	25	27	18		
<i>A</i>	20	20	12	8	6	00	5	00	8	88	51	23		
<i>B</i>	11	20	13	45	1	00	7	85	11	45	43	44		
<i>C</i>	11	20	10	30	0	00	3	33	4	50	28	29		
<i>D</i>	3	66	10	10	8	00	8	25	13	15	42	16		
<i>E</i>	18	16	20	10	6	50	2	50	20	25	68	22		
Total	63	20	65	20	21	14	27	40	56	37	232	26		

columns on the right). From these columns, it appears that the Zalof classifications (which were first chronologically) and the Tefoq classifications (which figures were most complex) were more extensively characterized by imagery of the original series than were the Deral and Kareg figures. Apart from this fact, however, the observers showed marked differences in the amount of such imagery in their classifications both of the same and of different groups. In the Zalof series *D* and *E* reported relatively more series-imagery than any of the other observers; in the cases of both these observers the appearance of imagery was correlated with the number of classifications which had been made (*cf.* following paragraph). In the later series—the Deral, Tefoq, and Kareg groups,—as well as in the combined classifications of all groups—*D* and *E* reported a smaller amount of series imagery than did any of the other observers. Of these two, *E* reported more imagery than *D*, *B* and *C* reported the most profuse imagery of the group, for the most part. *A* reported less than *B* and *C*, on the one hand, and more than *D* and *E* on the other.

b. The conditions under which imagery of the group occurred: Table II indicates the per cent of the classifications of each type which were complicated by the presence of group-imagery. Table III indicates the relation between the occurrence of group-imagery and the number of classifications which the observers had made. The total number of classifications was arranged in groups of five successive classifications (the last group numbering less than five, provided five was not a multiple of the total number) and Table III contains the number of classifications of each group in which series-imagery figured.

TABLE III

Relation between the occurrence of group-imagery and the number of classifications. The Roman numerals refer to groups of five successive classifications each; the figures in the other columns indicate the number of classifications in the group which were characterized by the presence of imagery of the original series. Thus, Observer A reported no such imagery in his first five classifications, none in his second five, one in his third five, etc. A dash indicates that the classifications were not sufficiently numerous to include a group of the advancement specified.

TABLE IV

This table shows the per cent of classifications in which attention was distracted in varying degree by striking non-essentials, with or without an ensuing negative response. The first column of figures contains the total number of classifications, of the series specified, furnished by each observer. The next four columns contain the per cent of instances in which occurred 1. distraction with a negative response; 2. distraction with no negative tendency; 3. distraction with or without negative tendency; and 4, non-focal-awareness of the variable feature.

	Observer	Total number classifications	Per cent distraction with negative response	Per cent distraction with no negative tendency	Per cent distraction with or without negative tendency	Per cent non-focal awareness of variable features
Zalof	A	17	6	12	18	0
	B	28	7	0	14	3.5
	C	15	0	7	7	0
	D	17	0	0	0	29
	E	24	4	0	4	0
	Total	101	4	5	9	6
Deral	A	10	10	10	20	0
	B	2	0	0	0	0
	C	10	0	10	10	0
	D	18	0	27	27	0
	E	23	17	9	9	0
	Total	63	8	14	8	0
Tefog	A	15	53	7	63	0
	B	13	23	23	46	0
	E	13	38	15	54	0
	Total	41	39	17	58	0
Kareg	A	9	1	2	33	0
	C	3	0	0	0	0
	D	7	0	0	0	14
	E	8	0	50	50	0
	Total	27	4	22	26	4
Total	A	51	21	13	35	0
	B	43	11	11	22	1
	C	28	0	9	9	0
	D	42	0	7	7	14
	E	68	14	11	26	0

From Tables II and III, it appears that in the cases of *E* and *D*, and of *C* in the Zalof series, at least, the appearance of imagery of the original group was correlated exclusively with the number of classifications which the observer had made; while in the cases of *A* and of *B*, the profusion of series-imagery depended to a large extent upon the type of classification. In *A*'s case, group-imagery was by far the most frequent with hesitant classifications, while in *B*'s case

it was most common with negative classifications, especially of the cautious type. With *B*, the failure of an essential feature to occur was in many cases marked by the superposition of a visual image of the feature upon the altered region. *C*'s results are too few to indicate definitely whether a correlation occurred between her group-imagery, on the one hand, and type of classification—or number of classifications, on the other hand.

c. The extent to which the process of classifying was diverted from its course by the intrusion of striking variables: Table IV contains for every observer the per cent of classifications in which striking variable features were attended to, with or without a resultant negative tendency. Here again, extensive individual differences are apparent. *C* and *D* in no instance reported that a negative tendency followed upon their attending to a striking variable, and (excepting for *D*, in the Deral group) it relatively seldom happened in the case either of *C* or of *D* that such a feature even stood out prominently to attention for ever so short a time. The reader will remember, of course, that neither *C* nor *B* participated in the experiments with the Tefoq series, which was more complex than the others, and in the course of which *A*, *B*, and *E* attended much more often to striking variables than they did in the other three groups. Nevertheless, if we compare the results of *D* and *C* in these last three groups with the results in the same groups of the other observers, we find that the former—especially *C*—paid least attention to variables. *A* attended most often to variables; in his case the standing-out of a variable was usually followed by a negative tendency and sometimes (two instances) by a spoken negative response, *B* stands between *D* and *C*, on the one hand, and *A* on the other. In *E*'s case, the attracting of attention was followed by a negative tendency in a small majority of instances; in two cases, he actually responded aloud with a negation. In the case of *B*, the negative tendency followed in *ca.* fifty per cent of cases.

d. The relative dominating-power of the process of classifying, and the affirmative or negative response-tendency. Table V indicates for each observer the per cent of the total number of classifications which were cautious, on the one hand, and premature, on the other hand.

TABLE V

This table shows the percentages of classifications of each type,—premature, facile, cautious, hesitant.

Observer	Total number of classifications	Per cent premature	Per cent facile	Per cent cautious	Per cent hesitant
A	51	25.5	37.2	17.7	19.6
C	28	17.8	57.3	10.7	14.2
B	43	13.9	41.8	18.8	25.5
D	42	11.9	28.5	31.1	28.5
E	68	4.4	51.4	14.8	29.4

Since a premature reaction was one in which the affirmative or negative response overcame the classification-process itself, it appears that the tendency to respond was relatively most potent in the case of *A*, and least potent in the case of *E*. The descending order of the observers is: *A, C, B, D, E*. When we compare the proportion of premature reactions with the number of cautious and hesitating reactions we find that a fairly close correspondence obtains between the descending order of premature, and the ascending order of cautious, reactions. *C*, who frequently reacted in very rapid fashion, constitutes one exception; the other is *E* in whose case it was difficult to distinguish cautious from facile reactions, and hence the figures in the table are less certain.

When we compare the classification-times of the different observers, it appears that the observers in whose cases the response-tendency was most frequently prepotent over the classification-process were the most rapid classifiers. Table VI contains the classification-times of every observer, for each type of classification; and Table VII indicates the descending order of rapidity of the observers, for every type of classification. A fairly close correspondence obtains between the descending order of rapidity, and the descending order of prepotence of reaction-tendencies, as shown in Table V.

TABLE VII

Descending order of rapidity of the observers in every type of classification

Aff.	Facile		Cautious		Hesitant
	Aff.	Neg.	Aff.	Neg.	
C	C	B	E		B
A	A	A	C		A
B	B	E	B		E
D	E	..	D		D
E	D	..	A		C

TABLE VI
Classification-times

	<i>Facile</i>		<i>Cautious</i>		<i>Hesitant</i>
	<i>Affirmative</i> Sec. M.V.	<i>Negative</i> Sec. M.V.	<i>Affirmative</i> Sec. M.V.	<i>Negative</i> Sec. M.V.	Sec. M.V.
<i>Zatof</i>	<i>A</i> 1.48±0.52	1.28±0.40	4.40±0.00	5.90±1.70	1.30±0.10
	<i>B</i> 1.40±0.47	1.58±0.39	3.00±0.00	2.00±0.50	2.50±0.40
	<i>C</i> 0.90±0.14	1.20±0.16	0.00±0.00	0.00±0.00	0.00±0.00
	<i>D</i> 1.78±0.00	2.30±0.10	2.60±0.20	2.70±0.20	4.91±2.34
	<i>E</i> 1.25±0.00	1.62±0.55	4.00±0.00	1.60±0.00	3.17±0.59
<i>Deral</i>	<i>A</i> 1.60±0.20	1.00±0.00	2.20±0.00	1.90±0.10	2.90±0.30
	<i>B</i>.....	.....	.....	.....	.....
	<i>C</i> 1.50±0.35	0.90±0.10	0.00±0.00	0.00±0.00	5.90±4.00
	<i>D</i> 0.00±0.00	3.50±1.00	5.80±1.00	4.10±0.90	6.00±1.40
	<i>E</i> 2.15±0.57	2.42±0.39	2.97±0.22	0.00±0.00	5.81±2.48
<i>Tefog</i>	<i>A</i> 1.30±0.30	1.80±0.30	4.00±0.80	5.00±0.00	5.90±1.80
	<i>B</i> 1.90±0.25	1.60±0.30	0.00±0.00	4.00±0.00	3.40±0.80
	<i>C</i> 1.00±0.00	0.00±0.00	0.00±0.00	2.70±0.30	0.00±0.00
	<i>D</i>.....	.....	.....	.....	.....
	<i>E</i> 5.00±0.48	2.80±1.10	8.20±0.00	0.00±0.00	7.60±3.20
<i>Kareg</i>	<i>A</i> 1.10±0.16	1.07±0.09	0.00±0.00	0.00±0.00	0.00±0.00
	<i>B</i>.....	.....	.....	.....	.....
	<i>C</i>.....	.....	.....	.....	.....
	<i>D</i> 0.00±0.00	1.00±0.00	4.60±0.60	3.00±0.00	6.60±3.40
	<i>E</i> 2.30±0.70	1.20±0.00	0.00±0.00	0.00±0.00	3.30±1.30
<i>Total</i>	<i>A</i> 1.37±0.29	1.08±0.26	3.53±0.80	4.20±0.90	3.36±0.40
	<i>B</i> 1.65±0.36	1.59±0.34	3.00±0.00	3.00±0.50	2.90±0.60
	<i>C</i> 1.13±0.24	1.05±0.13	0.00±0.00	2.70±0.30	5.90±4.00
	<i>D</i> 1.78±0.00	2.40±0.55	0.00±0.00	3.20±0.55	5.83±2.38
	<i>E</i> 2.70±0.58	2.01±0.35	4.33±0.60	1.60±0.00	4.97±1.89

F. SUMMARY. 1. The process of classifying,—the observers' manner of perceiving the classification-figures,—consisted in a series of experiences in which attention passed in order to the regions of the classification-cards whose counterparts in the group proper had contained essential features; *i. e.*, it consisted in a successive becoming focal—definite and intensive—of these regions. This course of attention persisted either until the regions of all the essential features had been examined, or until an essential feature failed to stand out when the regard passed to its region.

2. The process of classifying was sometimes complicated by the presence of components other than the perceptions of the classification-figure. These contents included vocal-kinaesthetic and auditory images of words which designated the observers' findings; kinaesthetic sensations of the eye-move-

ments involved in examining the figures; kinaesthesiae of internal imitation of the figures; and concrete visual and verbal imagery of the original series.

3. The process of classifying was initiated only by the hearing of the experimenter's instructions and by the perception that the figure had been exposed. When this process reinstated itself after an interruption, however, its recurrence was at times preceded by concrete visual or verbal imagery of the region of the figure which had not yet been explored; and sometimes by verbal imagery of self-instruction. It seems probable that imagery of the first type is to be regarded as an initial term of the reinstated process of classifying, rather than as imagery of intending to continue the exploration, or of setting up a goal-idea.

4. The component details of the process of classifying,—the conscious experiences that the classification-figures contained or failed to contain specific essential features, etc.,—consisted in the behavior in consciousness of the separate features of the classification-figures. This behavior depended upon the extent to which the regions of the essential features resembled the corresponding regions in the group-members. *a.* If a feature which the observer had found to be present in all of the group-figures was definitely present in the classification-figure, it flashed out into clear consciousness as attention passed to and over its region; and this facile and often very brief standing-out of the figure constituted in itself the affirmative answer to the question 'does it have the essential features?' which was present as the characteristic course of attention in the classification. It was sometimes complicated by the presence of additional contents—imagery of the original series, or contents which reinforced the observation of the figure itself, such as verbal imagery, kinaesthesiae of internal imitation, and the like. Again, it was often followed by a verbal affirmative response, imaged or overt. If the observation had not been completed, the attention shifted rapidly and readily on its course; and if the observer did not note the absence of any essential feature, an affirmative response was verbalized.

It sometimes happened that the affirmative response was verbalized before the course of the process of classifying was completed. Thus a premature reaction was given; the affirmative reaction-tendency overcame the process of classifying. Even here, however, the uncompleted process usually reasserted itself, operating on a last percept of the disappearing stimulus, or upon concrete visual imagery of the stimulus.

In some cases observers reported classifying of a type in many respects the opposite of the premature one. The successive features were noted in a slower and more painstaking fashion; the affirmative response followed less readily and rapidly.

The affirmative response itself usually consisted only in the ready standing-out of the feature, and the rapidity and uncontestedness with which the attention left it; it merged without delay into the continuing classifying-process. Sometimes, however, the attention-processes were complicated by additional components, such as relaxation, pleasantness, kinaesthesia of nodding, of waving the hand, or internal 'welling-up.' Verbal imagery of 'yes' was often present; and under certain conditions—usually, when the feature was the last one on the attention-route—a spoken 'yes' followed.

b. When a figure of the classification-series lacked one of the essential features, or possessed it in a crucially dissimilar form, the attention-course was arrested at that region, which became unusually clear. This halting of the attention constituted the negative answer to the question (present as the characteristic course of attention) of 'does it have the essential features?'; and it was usually followed immediately by a negative response and an abrupt termination of the attention-course. Occasionally the arrest of attention on the altered region was accompanied by more or less intensive kinaesthetic and organic sensations. Or imagery occurred of the region concerned as it had appeared in the group-figures themselves, and of supplementing the findings in the present figure.

In some cases, however, the negative response was not verbalized aloud, but instead the course of the classifying-process continued, in a relatively painstaking fashion.

The negative response itself was usually nothing more than the above-described sharp arresting of the attention, with the subsequent verbalized 'no.' Sometimes, however, it was complicated by the presence of additional contents,—more or less emphatic and intensive kinaesthetic and organic rejectings of the figure, verbal imagery of 'no,' and of words which expressed the reason for rejecting the figure.

c. When an essential feature was markedly dissimilar, yet neither definitely present nor absent in the classification-figure, attention remained persistently upon the region in question,—the consciousness of the region lasted, and it became very focal. When after a time the exploration of the figure was continued, attention was cautious and deliberate in its course, and it frequently returned to the altered region. This pro-

longed arrest upon the altered region was usually marked, sooner or later, by the presence of strains and tensions and affective contents of unpleasantness. Imagery of other sorts also occurred on many occasions; verbal imagery of questioning the nature of the altered aspect, or of fragments of the definition, or of sketchily present argument, as one aspect after another stood out in the altered region, or of silent vocalization of these aspects; and visual imagery of the corresponding region in figures of the group proper.

5. It sometimes happened that conspicuous novelties or strikingly altered non-essential features stood out in consciousness during the examination. These features were sometimes merely present in a marginal fashion, without influencing the main course of attention. Again, they became for a time very focal, but were not followed by affirmative or negative responses. Their focal presence was sometimes followed by verbal imagery of their non-essential character, with turning of attention to other regions. Usually, their standing-out was followed by a more or less energetic negative tendency, which was at times actually verbalized aloud.

6. The observers sometimes merely described the affirmative or negative responses without labelling them. In other cases they described them and also labelled them, sometimes as familiarity or unfamiliarity of the feature in question, but usually as acceptance or rejection of the latter, feeling that it was wrong, etc. The application in retrospect of some label to the experience depended largely upon the additional presence of striking kinaesthetic and organic and affective or other contents or factors; it also depended to some extent upon the individual observer. The nature of the label which was applied depended in part upon the individual observer; but it tended to be closely harmonious with the prevailing direction or course of consciousness, in this case, the process of classifying. The observers were in an "is-it-a-Zalof?" situation, and the normal interpretation of the experiences of arrest, or of ready passing on, of attention was obviously one of rejection or of acceptance, of feeling of figure being right or wrong, etc. The observers were not in a recognizing—a "have-I-seen-it-before?"—situation and hence the infrequency of the label of familiarity or of unfamiliarity is not surprising.

7. Two main sorts of process were thus operative in our classification experiments. One of these was the characteristic course of consciousness in the classifying as a whole; and the other was the response-tendency, which appeared with the standing-out of any feature. The former was more forward-

moving, more dynamic ; the latter, when it separated out from the former, tended toward the static ('conscious attitude'). It frequently failed to realize itself, however, the classifying-course continuing instead. When the response (especially the negative response) was not thus prevented from realizing itself, it became richer in imaginal and kinaesthetic content, and merged into complex attitudes, which were labelled as familiarity, acceptance, or especially unfamiliarity, rejection, and the like.

Ordinarily, the process of classifying prevailed until its completion, but at times the response-tendency became sufficiently strong to interrupt it for a longer or shorter time, the response even being verbalized aloud.

The introspections reveal the fact that a certain interdependence existed between the main process of classifying and the affirmative and negative response-tendencies. While the negative response-tendency often appeared when attention went to the region of a striking variable feature, nevertheless it relatively seldom appeared here in sufficiently energetic manner to lead to a negative spoken response. Its appearance apart from the normal route of the process of classifying apparently meant that its energy was diminished. On the other hand, the appearance of such an energetic negative tendency was followed by a checking and a becoming more cautious of the main process itself, when the latter became reinstated.

8. Individual Differences: Our observers presented numerous individual differences, both structural and functional. Structurally, they differed in the nature of the imagery which presented the members of the group proper; in the nature and modality of the imaginal reinforcement of the figures under observation; in the nature of the contents which entered into the experiences of doubt and hesitation; in the frequency and nature of personal reactions to the figures; and in the nature of the imaginal and sensory contents which accompanied experiences of affirmation and negation. The functional differences were concerned with the extent to which the process of classifying was accompanied by imagery of the group proper; with the conditions under which such imagery occurred; with the extent to which the process of classifying was diverted from its course by striking irrelevancies; and with the relative dominating power of the process of classifying, on the one hand, and of the affirmative or negative reaction-tendencies, on the other hand. With certain observers, the appearance of imagery of the original series depended upon the number of past experimental sittings with the series

in question; with others, it depended upon the type of classification, being more numerous with the hesitant or cautious negative type. In general, the observers in whose cases the response-tendency frequently overcame or delayed the main classification-process showed fewer cautious reactions; and their reaction-times were most rapid.

IV. CONCLUSIONS

The essence of the process of classifying, as this process occurred in our experiments, consisted in the manner of the observers' perceiving the object which he had been instructed to classify. This manner of perceiving consisted in the fact that the regions of essential group-features were stressed in consciousness, and that these regions behaved in consciousness in a fashion which depended upon their resemblance, or lack of resemblance, to the corresponding features in the group-members. In the former event, the regions in question passed in and out of consciousness in rapid and ready fashion, without retarding the course of attention. In the latter case, on the other hand, the course of attention was arrested sharply; these regions often persisted in consciousness, and they were frequently accompanied sooner or later by more or less focal and intensive kinaesthetic, organic, and affective contents which functioned in their conscious settings as definite rejectings of the figure.

This view is, we believe, in accord with those of numerous writers who hold that the generalizing-process is essentially a motor phenomenon. The classifying of a novel percept with a group of previously experienced ones occurs in virtue of the fact that the former arouses a reaction which is identical with that aroused by the latter.⁶² Within the writer's knowledge, the authors who have most persistently concerned themselves with the conscious phase of this motor response are Zetz and Müller-Freienfels. Betz⁶³ finds that in his own case, the motor reaction or 'attitude' is either projected out into space, *i. e.*, objectified, as a series of movements (whether kinaesthetically or visually conscious is not fully clear to the writer); or else it forms the basis of a feeling—*e. g.*, in the case of green, a 'calm, agreeable feeling.' A concept is a 'projected' attitude; and a novel phenomenon is subsumed under a concept when the attitude which it evokes 'fits in' with the concept-attitude (pp. 210 ff.). The meaning for consciousness of the expression 'fits in' is not clear to the writer. Whether it means an inference on the part of the systematizer, or an actual consciousness of 'fitting in' on the part of the experiencer, we cannot say.

Müller-Freienfels maintains that the motor reaction has a feeling as its conscious symptom; and he uses the term *Stellungnahme* as an

⁶² *Op. cit.* footnote 2 p. 57, p. 24.

⁶³ W. Betz, *Vorstellung und Einstellung. II. Ueber Begriffe. Arch. f. d. ges. Psychol.* XX, 1911, 186-225.

expression for the combination of motor disposition and feeling-symptom.⁶⁴ Feeling is not sensation, nor is it a property of sensation; whether its essence consists in movement, he leaves open.⁶⁵ Sensory situations which arouse the same *Stellungnahme* are subsumed under the same concept. Here again, the writer is uncertain as to whether Müller-Freienfels uses the term 'same' in an inferential sense, or as referring to a consciousness of sameness.

If we attempt to translate our findings into the language of Betz and Müller-Freienfels, we would conclude that the 'motor disposition' 'set free' in the percept may be present to consciousness in terms of the manner in which the observer perceives the object, *i. e.*, the shifting parts of the latter which stand out, and the duration and intensity and focality of the standing-out of the several parts, or in terms of kinaesthesia of the observation as well.⁶⁶ We would maintain that the 'feeling' referred to may possibly be analyzable into the peculiar temporal and focality aspects of the percept which constituted its being included in the group, or into those which constituted its being rejected; and we would suggest further that the presence in addition of an awareness or attitude of sameness, or of 'fitting in', is a function of the momentary conscious situation of the observer, and of the use which he is to make of the experience. If, *e. g.*, he is told to identify the object, his manner of perceiving it will be supplemented by verbal or kinaesthetic assent, which constitutes an awareness of sameness. If he is making a different use of the percept (*e. g.*, examining its features for specific points⁶⁷), he will have no such awareness of its identity with the group.

⁶⁴ R. Müller-Freienfels. Typenvorstellungen und Begriffe. *Zeitschr. f. Psychol.*, LXIV, 1913, 386-433.

⁶⁵ R. Müller-Freienfels. Die Bedeutung der motorischen Faktoren und der Gefühle für Wahrnehmung, Aufmerksamkeit, und Urteil. *Viertelj. f. wiss. Phil.*, XXXVIII, 1914, 215-253; 335-371.

⁶⁶ We believe that observers vary with respect to the manner in which such motor phenomena are present to consciousness, *i. e.*, whether they are present as shifting visual (or auditory) perception, or as kinaesthesia, or both.

⁶⁷ Cf. *op. cit.* footnote 2 p. 57, pp. 97 ff.